This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Gs - AU - N

HARVARD UNIVERSITY

LIBRARY

OF THE

Museum of Comparative Zoölogy

GS-AU-N

MINES AND MINERAL STATISTICS.

ANNUAL REPORT

OF THE

DEPARTMENT OF MINES,

NEW SOUTH WALES,

FOR THE YEAR

1877.

SYDNEY: THOMAS RICHARDS, GOVERNMENT PRINTER.

[6s.] 1878.

MEMORANDUM.

In acknowledging the receipt of this Report I have much pleasure in adding my testimony to the efficiency and zeal with which the officers of this Department have carried out their various duties.

However much it may be regretted that some of our mining industries are in a depressed state at present, there are strong hopes that by the means of mechanical appliances—as, for instance, the rock-drills which have been introduced into the Colony—a fresh stimulus will be given to mining research, inasmuch as a more economical and expeditious method of carrying on mining operations will result from their use.

It must not be forgotten that the liberality of Parliament in providing a sum of £5,000 to be expended on assisting prospecting for gold will most probably be attended with good results. No one can suppose that nearly all the gold in New South Wales has been won, or that all the fields in which gold exists have been discovered.

I have to congratulate the Colony and the Department upon securing to the Geological Staff, in addition to their able Geological Surveyor, Mr. Wilkinson, the services of two other gentlemen of high attainments. It is assured that with the scientific opinion now at command a very great amount of valuable information and advice can be obtained that will prove to be of incalculable benefit to those who are inclined to expend their labour and capital in developing the mineral resources of this Country.

For the information of coal miners and others engaged in deep and extensive underground operations, I desire to mention that very improved methods of signalling have been introduced, notably in the mining districts of the United States. The telephone is used there with great success. By its means all parts of the mine may be brought into immediate and direct communication with each other. It cannot be urged too strongly that the most efficient mode of signalling tends to prevent serious accidents to life and limb.

W. H. SUTTOR.

Mines Department,
July 24, 1878.

TABLE OF CONTENTS.

PAGE.

SUMMARY, TOTAL QUANTITY AND VALUE OF MINERALS 41

GOLD 4, 5, 6, 7, 8, 9, 10, 12

„ Tables (Royal Mint and Mining Registrars' Returns) 6, 7

„ „ (Customs Returns) 8

„ Average Yield, Alluvial Mines 9

„ „ Quartz Mines 9

„ Barrington Gold Field 10

„ Assays, Pyrites, Tailings 12, 13, 14, 15, 16, 17, 18, 19

„ Tables (Qantity and Value, Number of Miners, Value of Plant, Averages, &c.) 43, 44, 45, 46, 48, 49, 50, 51, 52, 53, 54

„ Quartz Reefs, Width, Dip, Average Yield, &c. 55

„ Machinery 56, 57

„ Reports on Gold Fields. (See Wardens' and Mining Registrars' Reports.)

COAL 19, 21, 22

„ Decennial Table Exports, Intercolonial and Foreign 20

„ „ Home Consumption 20

„ „ Average Price 20

„ Depth of Coal Beds at and near Sydney 22, 23

„ Depth of Coal and Other Mines in Europe 24

„ Analyses of Coal. (Professor Liversidge.) 24, 25, 26, 27, 28, 29

„ Table (Output of Coal) 164, 165

„ Report of Examiner of Coal Fields—Output, Accidents, &c. .... 166 to 178, 188, 189, 191

„ „ „ Sections of Coal Seams, &c. .... 179 to 188

„ „ „ Borings for Coal 189, 190

„ Report of Inspector of Collieries .... 193 to 196

„ Report of Geological Surveyor (on Coal Lands) 197, 198

„ Calorific Power of Certain Samples. (Professor Liversidge.) 209

SHALE.—Output, Value, &c. 30, 31, 165, 192

„ Sections of Seams. (Examiner of Coal Fields.) 180, 181

TIN.—Quantity, Value, Extent of Tin Fields, Exports, &c., &c. 30, 31, 32, 33

„ Table (Number of Miners, Quantity and Value of Tin, Value of Machinery) 47

„ Southern Field—Mr. Warden Brownrigg 99, 100

„ Northern Fields—Mr. Warden Buchannan .... 102 to 106

„ „ Mr. Warden Martin 109

„ „ Mr. Warden Graham 110, 111, 112

„ „ Mining Registrars .... 136 to 151, 154, 155

COPPER.—Extent of Cupriferous Formations, Quantity, Value, Exports, &c., &c. 33, 37, 38, 179

„ Analyses of Ores. (Professor Liversidge) 34, 35, 36, 37, 210, 212

„ Table (Number of Mines, Quantity and Value of Copper, Value of Machinery) 47

„ Reports (Geological Surveyor) 205

„ „ (Wardens') 58, 59, 72, 107

„ „ (Mining Registrars') 114, 117

PAGE.
IRON.—Analyses of Ores (Professor Liversidge), &c. ... 38, 39
„ Reports (Mining Registrars') ... 114
„ „ (Examiner of Coal Fields) ... 178
SILVER ... 39
„ Report (Mining Registrar) ... 152
LEAD ... 39
ANTIMONY.—Analyses, &c., &c. ... 40
„ Reports (Wardens' and Mining Registrars') ... 107, 113, 135, 153
ASBESTOS ... 40
REPORTS ON GOLD FIELDS, TIN FIELDS, &c. :—
Bathurst Mining District—Mr. Warden Smith ... 58
Orange Division—Mr. Warden Lane ... 58
Carcoar „ Mr. Warden North ... 59
Bathurst „ Mr. Mining Registrar Maybury ... 114
Trunkey „ Mr. Mining Registrar Waldie ... 115
Tuena „ Mr. Mining Registrar Cotter ... 116
Carcoar „ Mr. Mining Registrar Warner ... 116
Cowra „ Mr. Mining Registrar Arkins ... 117
Oberon „ Mr. Mining Registrar Cunningham ... 117
Rockley „ Mr. Mining Registrar Cromie ... 117
Mitchell's Creek Division—Mr. Mining Registrar Schumack ... 117
Tambaroora and Turon Mining District—Mr. Warden Sharpe ... 59
Hill End Division—Mr. Mining Registrar Weston ... 117
Sofala „ Mr. Mining Registrar Fagan ... 118
Ironbarks „ Mr. Mining Registrar Hanley ... 119
Mudgee Mining District—Mr. Warden Browne ... 70
Gulgong and Home Rule Division—Mr. Mining Registrar Stephen ... 122
Mudgee Division—Mr. Mining Registrar Isaacs ... 122
Hargraves „ Mr. Mining Registrar O'Brien ... 122
Wellington „ Mr. Mining Registrar Marsh ... 122
Lachlan Mining District—Mr. Warden Dalton ... 74
Southern Division—Mr. Warden Robinson ... 89
Forbes „ Mr. Mining Registrar Osborne ... 123
Cargo „ Mr. Mining Registrar Hutton ... 124
Grenfell „ Mr. Mining Registrar Parker ... 125
Young „ Mr. Mining Registrar Edwards ... 126
Southern Mining District—Mr. Warden De Boos ... 89
Braidwood Division—Mr. Mining Registrar Robertson ... 127
Araluen „ Mr. Mining Registrar Carlisle ... 128
Major's Creek „ Mr. Mining Registrar Heazlett ... 128
Little River „ Mr. Mining Registrar Galway ... 129
Nerigundah „ Mr. Mining Registrar Foster ... 130
Shoalhaven „ Mr. Mining Registrar Lovegrove ... 130
Moruya „ Mr. Mining Registrar Clarke ... 131
Tumut and Adelong Mining District—Mr. Warden Vyner ... 98
Albury Division—Mr. Warden Brownrigg ... 98
Tumut „ Mr. Mining Registrar Hilton ... 131
Adelong „ Mr. Mining Registrar Morris ... 131
Gundagai „ Mr. Mining Registrar Armour ... 131

PAGE.

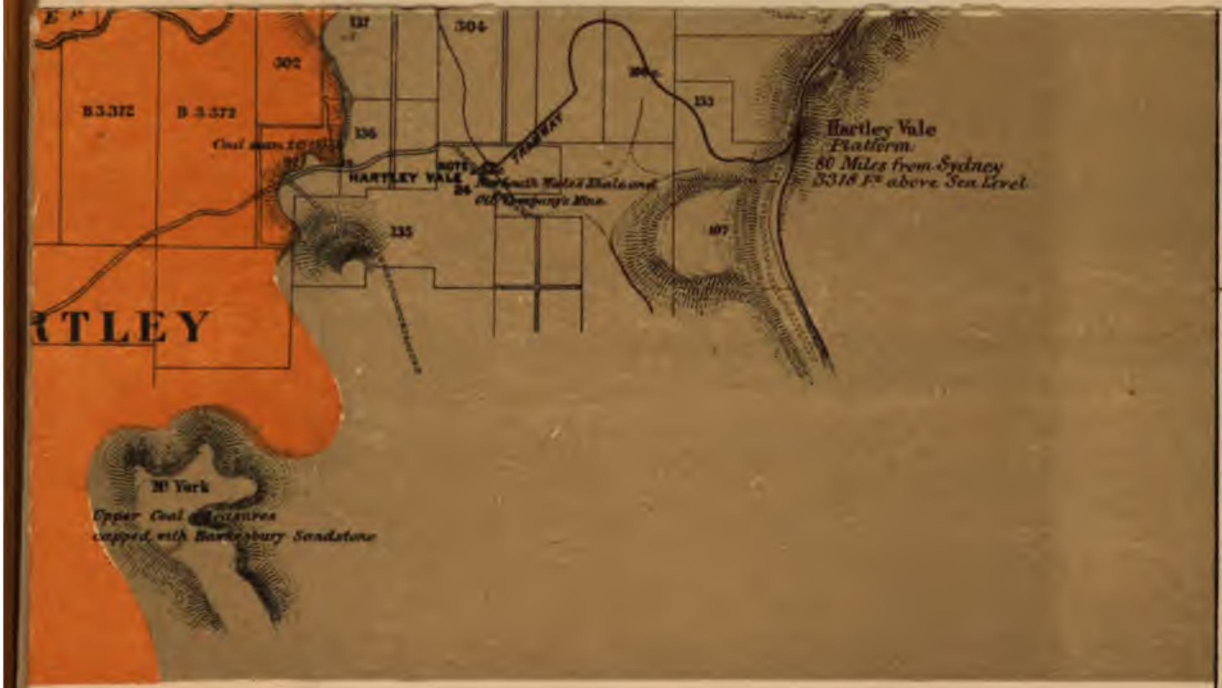
REPORTS ON GOLD FIELDS, TIN FIELDS, &c.—*continued.*

Tumut and Adelong Mining District—*continued.*

Tumbarumba Division—Mining Registrar Langford 132
Kiandra „ Mr. Mining Registrar Smythe 133
Queanbeyan „ Mr. Mining Registrar Willans 133
Yarrara „ Mr. Mining Registrar Armstrong 133
Albury „ Mr. Mining Registrar Crommelin 133
Peel and Uralla Mining District—Mr. Warden Buchannan 100
Tamworth Division—Mr. Warden Irving 106
Bingera „ Mr. Warden Brougham 107
Inverell „ Mr. Warden Fraser 108
Glen Innes „ Mr. Warden Martin 108
Barrington „ Mr. Warden Smith 109
Armidale „ Mr. Mining Registrar Marriott 134
Nundle „ Mr. Mining Registrar Kermode 134
Barraba „ Mr. Mining Registrar Flanagan 136
Bingera „ Mr. Mining Registrar Doyle 136
Scone „ Mr. Mining Registrar Wilshire 136
Tingha „ Mr. Mining Registrar Jones 136
Barrington (Back Creek) Division—Mr. Mining Registrar Langworthy 140
Walcha Division—Mr. Mining Registrar Love 140
Glen Innes „ Mr. Mining Registrar Rogerson 140
New England and Clarence Mining District—Mr. Warden Graham 110
Lismore Division—Mr. Warden Elliott 113
Vegetable Creek Division—Mr. Mining Registrar Gower 141
Dalmorton „ Mr. Mining Registrar Poole 152
Lunatic „ Mining Registrar Synge 152
Lionsville „ Mr. Mining Registrar Fisher 153
Ballina „ Mr. Mining Registrar Bassman 154
Wilson's Downfall „ Mr. Mining Registrar Hicks 154
REPORT OF INSPECTOR OF MINES 155
Canowindra 161
Cargo 162
Ironbarks, Stoney Creek, and Muckerawa 163
PROGRESS REPORT OF GEOLOGICAL SURVEY, by Mr. C. S. Wilkinson, F.G.S., Government Geologist 197
LIST OF DONATIONS TO THE MUSEUM OF MINES, SYDNEY 208
REPORT UPON MINERAL SPECIMENS EXAMINED DURING THE YEAR 1877 (Professor Liversidge) ... 210

EW
TL

EW SOUTH WALES



ANNUAL REPORT.

To the Honorable William Henry Suttor, Esquire, M.P., Minister for Mines, &c., &c.

Sir,

I have the honor to report, that during the year 1877, 519 applications to lease land for mining purposes were received. Of these, 253 were for auriferous and 266 for mineral land. During the same year 293 applications for gold mining leases representing in the aggregate 1,435 acres, and 5,255 applications for mineral leases representing in the aggregate about 137,145 acres of land, have been disposed of; and 93 applications have been received under the 27th and 28th sections of the Mining Act, and 56 applications representing 1,568 acres of land have been dealt with (*i.e.*, granted or refused). The following table shows the area now under lease or promise of lease:—

Gold-mining and Mineral Lands under Lease, Promise of Lease, or Application to Lease.

Mineral.	Mining Act of 1874 Area.	Gold Fields Act of 1866—Area.	Crown Lands Occupation Act of 1861—Area.	Total Area.
	acres.	acres.	acres.	acres.
Gold	1,358	5,581	....	6,939
Coal	8,553	....	22,051	30,604
Shale	481	....	2,033	2,514
Tin	6,320	....	37,295	43,615
Copper	1,760	....	18,194	19,954
Copper and Silver	....	....	560	560
Copper and Tin	....	....	180	180
Silver	100	....	201	301
Silver and Lead	....	....	870	870
Galena	100	....	....	100
Galena and Copper	....	....	20	20
Iron	262	....	320	582
Iron and Copper	....	....	200	200
Iron and Coal	....	....	420	420
Antimony	60	....	560	620
Sulphur	40	....	....	40
Lead	20	....	40	60
Lead and Copper	....	....	40	40
Plumbago	....	....	120	120
Diamonds	....	....	230	230
Quicksilver	....	....	53	53
Manganese	....	....	40	40
Gypsum	....	....	20	20
Graphite	....	....	40	40
Opalite	....	....	20	20
Cinnabar	....	....	341	341
Whetstone	....	....	40	40
Slate	....	....	20	20
Minerals not stated	....	....	15,726	15,726
Totals	19,054	5,581	99,634	124,269

In addition to this, great exertion has been made to collect and diffuse the fullest information respecting our mineral wealth, also as to what lands containing mineral deposits are available, and what steps are necessary to secure possession of such lands.

Not only have numerous and valuable additions been made to the collection of Minerals and Fossils in the Department, but collections illustrative of the mineral resources and geology of the Colony have been exhibited at the Sydney Metropolitan Exhibition, at Muswellbrook, and at Brisbane, and a most extensive and interesting collection has been arranged and forwarded to the International Exhibition to be held in Paris. This collection, considering the short time the Department has been in existence, I submit, reflects the highest credit upon the officers of the Department, and especially upon Mr. Wilkinson, the Geological Surveyor, who has not only contributed largely to the collection, but has had the sole charge of its arrangement.

Already 175 analyses, besides numerous examinations of minerals, have been made for the information of persons who are engaged in prospecting, or who are anxious to develope new deposits. These have led to the satisfactory prosecution of works for the development of valuable mineral deposits, and have prevented the waste of capital and energy upon deposits possessing no economic value.

During the year the Geological Surveyor has, besides performing numerous other important duties, examined and reported upon the following Gold Fields:—Demondrille, Murrumburrah, Campbell's River, Native Dog, Stoney Creek, Oberon, Gilmandyke Creek, and Copperhannia, besides examining country in the Abercrombie, Tuena, and Trunkey districts, and has prepared a sketch geological map (which is published with this report) embracing an area of over 400 square miles, which will prove of the greatest value to the miner.

It has been my pleasing duty on more than one occasion to receive evidence of the practical value of Mr. Wilkinson's labours, in that miners who have followed his advice have succeeded in finding the mineral for which they were searching. It is much to be regretted that the multiplicity of duties cast upon this officer (of whose ability and industry I cannot speak in too high praise) prevent him from being constantly engaged upon the examination of our gold fields, until he shall have completed this important work, the object of which is to make known our auriferous deposits and to throw open to settlement land not immediately required for mining purposes.

While speaking of Mr. Wilkinson, I may mention that his geological map of the districts of Wallerawang, Bowenfels, Rydal, and Hartley, compiled from his own survey, has been published. This map—a copy of which on a reduced scale accompanies this report—covers an area of about 160 square miles, and shows the various geological formations of this important locality. The extent of the Coal Measures, Devonian and granite rocks, as well as the iron ore and limestone deposits, are clearly indicated, and the position of all the collieries of the Western Coal Field is shown.

The map contains copious explanatory notes and analyses, showing that rich clay-band iron ores occur in the Coal Measures, while brown hematite and magnetic ores are found in the Devonian strata. A section of the country from Mount Lambie through Rydal and the Great Dividing Range, thence across the Cox River and through Mount Walker and Lithgow Valley, is given, and shows the relative positions of the principal geological formations. The information is of the highest practical value and reflects great credit upon Mr. Wilkinson.

It is matter of regret that similar maps of the Northern and Southern Coal Fields cannot be prepared; but it would be quite impossible to undertake such extensive surveys without a large addition to the present staff of the department.

The Wardens and other officers have performed their several duties in a highly satisfactory manner, and have on all occasions displayed commendable zeal and an earnest desire to advance the interests and attend to the wants of the miners. The Inspector of Mines (Mr. Slee) has been unremitting in the discharge of his important functions, and has not only given general satisfaction to the mining community, but has in many instances contributed to bring about improved methods of constructing mine works.

I am happy to be able to report that nearly all the old applications for gold mining and mineral leases have been cleared off, and that a considerable area of auriferous and mineral land that was locked up under these applications has been thrown open to the miners, and that the utmost exertions have been made to supply to the public accurate information as to the position of such lands.

During the year locality maps of three of the principal Gold Fields, viz., Parkes, Forbes, and Hill End, have been completed, which show the position of every lease, whether in force or cancelled, distinguishing the land which is open to be taken up from that which is under lease. These maps represent an area of 15⅔ square miles at Forbes, 15½ square miles at Parkes, and 42½ square miles at Hill End, and the last-named shows the relative positions of about 950 cancelled leases and about 116 now in force; and, in addition to the number of each lease, gives where practicable the name of the lessee or company, and shows the position of these leases in relation to towns, villages, hills, gullies, creeks, &c., &c., so as to facilitate the search for them on the ground. These maps having been lithographed will be sold at such a price as to bring them within the reach of all who desire them, and for the information of those persons who cannot or do not desire to purchase, the maps will be exhibited free of charge in the local gold fields offices.

In view of the defective system under which the surveys were made on the gold fields before the establishment of the Mining Department, and the irregularities which in consequence crept in, the work of compiling accurate locality maps has been attended with almost insurmountable difficulties, and the Chief Mining Surveyor, the Chief Draftsman, and their staff, deserve the highest praise for the satisfactory manner in which they have performed this important and useful work.

Maps of other important localities are now in course of preparation, and I hope during 1878 a valuable addition will be made to the information already compiled and published. These maps, in addition to the information they afford to the public as to the lands that are open for occupation, will materially assist the Geological Surveyor in putting upon record the results of his investigations, in the localities delineated, in such a form as will convey to the miner the fullest and most accurate information.

In submitting my report, and the reports of the officers of the department, upon the mines and mineral products of this Colony for the year 1877, I do myself the honor to point out that notwithstanding the very severe and long-continued drought which has so seriously affected many important industries, and has almost paralyzed mining enterprise in some of our most important fields, the total output of minerals as a whole has exceeded in value that of the preceding year by £50,065. This fact I submit affords strong and gratifying evidence, not only of the enterprise of those engaged in mining pursuits, but also of the extent and value of the mineral resources of this Colony.

GOLD.

The falling off in our yield of gold, though great, is less than might under all the circumstances have been expected, for it will be seen by referring to the reports of the Wardens and other gold fields officers, that on almost every field the want of water has not only put a stop to the working of mines that were in operation, but it has, as a rule, rendered prospecting works by which new deposits might have been opened up quite impracticable.

Of the few persons who have been out prospecting, some report satisfactory progress, though they have had to carry the earth miles in search of water to test it. And where the miners have, in some instances, persevered in the work of raising auriferous earth, they have been compelled to stack it until a supply of water could be obtained.

Had any large proportion of our miners been able to continue to raise and stack the earth for future treatment, the yield of the year 1878 might, in view of the late rains, have been largely increased thereby; but, unfortunately, the miners as a rule are too poor to pursue such a course for any lengthened period, and consequently very large numbers have been compelled to abandon mining, and to seek in other pursuits the means of supporting themselves and families until a fall of rain affords a supply of water that will enable them to resume mining operations under more favourable circumstances.

Fortunately, the scarcity of labourers in many parts of the Colony has rendered it an easy matter for them to obtain employment at good wages, and it is not at all improbable that while the demand for labour continues, many of them will be reluctant to abandon steady employment and regular wages for the more precarious pursuit of the gold miner, notwithstanding the charm of a possible rich find of gold which may at any time reward his industry, and consequently many promising gold fields may remain untouched for some time to come unless new arrivals shall be attracted to them.

There is at present, and probably always will be, a great difficulty in directing those who are desirous of engaging in mining pursuits to a particular locality where they may at once find profitable employment; but it must be patent to those who read carefully the reports of the gold fields' officers, that there are numerous fields which have not been thoroughly prospected, and which afford reasonable promise of success and almost a certainty (except in the case of a drought such as has just ended) of the means of subsistence to those who will persevere—

Mr. Warden Smith (Bathurst District) says—" Miners, more especially Chinese, can during wet seasons obtain good livings by working for gold, in almost every creek and gully that flows into the Abercrombie River." Mr. Warden Sharpe (Hill End), speaking of the abandoned mines in that field, says—"In very few instances was anything more done than the mere piercing of the vein by a shaft or tunnel; sinking or driving on the reef, the true test of its value, has been in most instances altogether neglected." These veins as a rule require capital to thoroughly test them. Mr. Warden Dalton (Lachlan) says—" I dc not believe the auriferous deposits to have been exhausted, or any portion of the deep alluvium of this district, with rare exceptions, to have been fairly prospected. The heads of leads alone have been worked." " The surface of the deep ground round the southern base of the auriferous ranges at the Tyagong is yet unbroken." " The deep alluvium * * * on the eastern side of Grenfell has been worked just enough to prove that it contains payable gold." Mr. Warden Brownrigg (Albury) says—"The district is possessed of large mineral resources, only requiring the application of more capital, enterprise, and better directed labour towards their development." Mr. Warden Buchanan, speaking of the quartz reefs at Glen Morrison, says—" A crushing of 50 tons * * * realized 716 ozs." And yet upon this gold field there are only very few miners at work. Mr. Warden Irving (Tamworth) reports, that between August and December last two men obtained £1,000 worth of gold from a new reef near Nundle, known as the " Brown Snake Reef."

The tables annexed to this report show that the number of miners engaged in gold mining in this Colony during 1877 was 6,974, and that the quantity of gold won was 124,110 ozs. 10 dwts., valued at £471,418 4s. 4d. Dividing this quantity by the number of miners, gives to each miner 17 ozs. 15 dwts. 22 grs. of gold, a slight decrease upon the preceding year; and dividing the value by the number of miners, gives as the earnings of each miner for the year £67 11s. 10d.; but then it must be borne in mind that the year was an unexceptionally bad one, owing to the severe drought, and that a very large proportion of the miners were unemployed or followed some other pursuit during a great part of the year. Of course this mode of estimating the earnings of the gold miners is not satisfactory, and can be regarded only as a very rough approximation.

In considering the average earnings of miners who are not employed as mere wages men, the fact is too often lost sight of that they as a rule live much more cheaply than artisans and labourers in towns, that they are their own masters, and that every miner has a chance of becoming suddenly rich. As a rule, the gold miner pays neither rent nor municipal taxes. He certainly pays ten shillings per annum for a miners' right; and he may, if he so desire, hold his mine under lease, and then he pays rent for it—but that is optional with him. He can if he choose fence in as much land as will enable him to grow all the vegetables he and his family require; and he can, as a rule, obtain free grass for as many cows and horses as he requires for the use of his family. Moreover, he gets fuel and water free of cost, and at the worst has merely the labour of procuring and bringing them to his home.

QUANTITIES of gold imported into the Royal Mint, Sydney, during 1876 and 1877, compared:—

District.	Division.	1876.	1877.	Increase.	Decrease.
Bathurst	Bathurst	5,450·36	4,124·80	....	1,325·56
	Carcoar	3,753·43	3,184·10	....	569·33
	Orange	6,672·80	6,937·62	264·82	....
Tambaroora and Turon	Hill End	17,299·03	18,165·80	866·77	....
	Tambaroora	169·79	144·50	....	25·29
	Sofala	7,109·83	5,462·06	....	1,647·77
	Stoney Creek	6,170·63	2,275·48	....	3,895·15
Mudgee	Mudgee	5,436·26	5,838·76	402·50	....
	Gulgong	16,236·78	11,402·82	....	4,833·96
	Hargraves	1,991·15	2,029·45	38·30	....
	Wellington	297·69	2,928·77	2,631·08	....
Lachlan	Parkes	17,384·67	9,257·70	....	8,126·97
	Tichborne	5,672·00	....	....	5,672·00
	Forbes	904·39	193·91	....	710·48
	Grenfell	747·82	1,206·56	458·74	....
	Young	752·54	977·11	224·57	....
Southern	Goulburn	601·07	222·63	....	378·44
	Braidwood	9,003·51	6,372·58	....	2,630·93
	Araluen	2,331·06	3,414·01	1,082·95	....
Tumut and Adelong	Adelong	16,432·54	12,174·93	....	4,257·61
	Tumut	1,414·49	1,979·59	565·10	....
	Yass	....	17·29	17·29	....
	Tumbarumba	28·05	19·57	....	8·48
	Wagga Wagga	....	176·08	176·08	....
	Gundagai	134·13	43·17	....	90·96
	Cooma	743·16	987·34	244·18	....
	Kiandra	242·98	224·69	....	18·29
Peel and Uralla	Armidale	1,165·55	1,241·45	75·90	....
	Rocky River	1,635·42	596·30	....	1,039 12
	Nundle	940·21	721·06	....	219·15
	Tamworth	1,582·28	1,402·15	....	180·13
	Scone	18·05	16·27	....	1·78
Localities unknown	....	21,209·81	17,854·83	....	3,354·98
	Total	153,531·48	121,593·38	7,048·28	38,986·38

SUMMARY.

District.	1876.	1877.
Bathurst	15,876·59	14,246·52
Tambaroora and Turon	30,749·28	26,047·84
Mudgee	23,961·88	22,199·80
Lachlan	25,461·42	11,635·28
Southern	11·935·64	10,009·22
Tumut and Adelong	18,995·35	15,622·66
Peel and Uralla	5,341·51	3,977·23
Unknown	21,209·81	17,854·83
	153,531·48	121,593·38

The above table, compiled from information kindly furnished by the Deputy Master of the Mint (R. Hunt, Esq., F.G.S.,), shows a decrease in our gold yield for 1877, as compared with a similar return for 1876, of 31,938 ozs.

The following table shows that, comparing the quantities of gold won in the several districts as returned by the officers of the department with the information furnished by the Deputy Master of the Mint, the quantity won exceeds the quantity imported into the Mint by 329 ozs.; but if the quantity exported be added to the quantity sent to the Mint, it would exceed the quantity reported as won:—

RETURNS of Gold for 1877, from the Mint and the Mining Registrars, compared.

	Mint.	Mining Registrars.	Excess.	Deficiency.
	ozs.	ozs.	ozs.	ozs.
Bathurst	14,247	12,477	1,770	....
Tambaroora and Turon	26,048	26,760	....	712
Mudgee	22,200	24,157	....	1,957
Lachlan	11,635	14,457	....	2,822
Southern	10,009	12,787	....	2,778
Tumut and Adelong	15,623	19,799	....	4,176
Peel and Uralla	3,977	7,927	....	3,950
New England and Clarence	....	3,559	....	3,559
Locality unknown	17,855	....	17,855	....
			19,625	19,954
The quantity returned by the Mining Registrars exceeds the quantity sent to the Mint by			329	
			19,954	

The following table shows quantities of gold won in the several districts during the years 1876 and 1877, according to the returns furnished by the Mining Registrars, &c., and exhibits a decrease in the yield for 1877 of 45,488 ozs. :—

MINING REGISTRARS' Returns of Gold for 1876 and 1877 compared.

	1876.	1877.	Increase.	Decrease.
	ozs.	ozs.	ozs.	ozs.
Bathurst	15,514	12,477	....	3,037
Tambaroora and Turon	30,124	26,760	....	3,364
Mudgee	34,646	24,157	....	10,489
Lachlan	40,598	14,457	....	26,141
Southern	11,832	12,787	955	....
Tumut and Adelong	21,326	19,799	....	1,527
Peel and Uralla	9,478	7,927	....	1,551
New England and Clarence	3,893	3,559	....	334
	167,411	121,923	955	46,443
		Less—Increase		955
		Decrease in yield for 1877		45,488

But by comparing the returns of the several localities for each year, it will be seen that the decrease is most apparent in those districts where the gold is mainly derived from alluvial deposits, which to some extent bears out the statement that the decreased yield is due to the drought; because, though in some localities the crushing-mills have been stopped owing to scarcity of water, the effects of the drought have been felt chiefly amongst the alluvial miners, who require for washing purposes an abundant supply of water.

In the early part of the year the Great Victoria Company at Adelong successfully established its claim to the reward of £1,000, offered by the Government to the first discoverers of payable quartz at a greater depth (perpendicular) than 800 feet below the cap of the reef. Before paying over the reward the discovery was subjected to a most searching examination and test conducted by Mr. Wilkinson, the Geological Surveyor, and Mr. Slee, the Inspector of Mines, and it has established the important fact that in the only locality where our quartz reefs have been tested to so great a depth the stone has been found to contain gold in paying quantities.

The quantity of gold passed through the Customs during 1877 is as follows:—

Dust.		Bars.		Auriferous Quartz.		Total.	
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
ozs. 1,164·4	£ 4,177	1,352·19	£ 5,520·0	pkgs. 110	£ 2,520	ozs. 2,516·59 110 pkgs.	£ 12,217

I am indebted to the Honorable Geoffrey Eagar, the Under Secretary for Finance and Trade, for the information as to the quantity and value of gold exported. The value of the gold exported in 1877 slighty exceeds that of 1876.

The following table contains a statement of the results obtained from the treatment of certain parcels of wash-dirt from some of our alluvial mines during 1877, compared with the results similarly obtained in 1876. Though there are no returns from some of the districts, the aggregate quantity included in the returns for 1877 slightly exceeds that for 1876, but it is evident that only a very small portion of the earth treated is included in these returns. It is most difficult to induce the miners to furnish such information, and I am convinced that no blame in this respect rests upon the officers of the department.

Unfortunately the results supplied furnish no guide in forming an estimate of the average yield per ton of wash-dirt obtained from our alluvial mines as a whole. From the information supplied it would appear that the average yield in 1877 is considerably less than in 1876, which is possibly due to some extent to the scarcity of water at Parkes and Gulgong, where of late the highest averages have been obtained.

According to the latest report of the Victorian Department of Mines in my possession, the average yield per ton of alluvium in that Colony is 21·89 grains, which, though representing the result obtained from nearly the same quantity of earth, is less than the average yield from our mines, namely, 1 dwt. 2·32 grains, as indicated in the following table:—

Comparative Statement of average yields from Alluvial Mines for 1876-7.

1876.				1877.			
District.	Quantity.	Average per Ton.	Yield of Gold.	District.	Quantity.	Average per Ton.	Yield of Gold.
	Tons.	ozs. dwts. grs.	ozs. dwts. grs.		Tons.	ozs. dwts. grs.	ozs. dwts. grs.
Bathurst	24,484	0 0 22·09	1,126 16 0	Bathurst	21,625	0 2 7·58	2,504 0 0
Mudgee	44,774	0 2 12·61	5,653 16 23	Tambaroora & Turon	1,674	0 3 13·44	297 19 16
Lachlan	9,148	1 0 1·18	9,170 10 14	Mudgee	1,160	0 3 0·00	174 0 0
Southern	14,224	0 0 19·58	580 5 20	Lachlan	33,078	0 3 21·62	6,452 1 0
Tumut and Adelong.	79,200	0 0 1·18	194 16 0	Southern	143,309	0 0 5·31	1,587 17 11
Peel and Uralla	600	0 2 16·00	80 0 0				
New England and Clarence	200	0 15 0·00	150 0 0				
Total	172,630	0 1 23·14	16,956 5 9	Total	200,846	0 1 2·32	11,015 18 3

The returns furnished respecting the results obtained during 1877 from the crushing of certain parcels of quartz from some of our quartz mines are not so full as in 1876. The deficiency is mainly noticeable in the return from the Bathurst and Mudgee Districts, and as to the former, may to some extent be due to the difficulty experienced in treating the stone from some of the reefs at Mitchell's Creek; and as to the latter, it is probably due to the drought.

However, the parcels included in the following table amount in the aggregate to little more than half the quantity in the return for 1876; but the results obtained are satisfactory, as showing a considerable increase in the average yield per ton.

The average yield per ton of quartz in Victoria, according to the latest report in my possession, is 9 dwts. 1·02 grains, which is rather less than one-half the average yield from the parcels reported in the following table, namely, 18 dwts. 14·73 grains, but the Victorian report includes a very much larger quantity of stone.

Comparative Statement of average yields from Quartz Mines for 1876-7.

1876.				1877.			
District.	Quantity.	Average per Ton.	Yield of Gold.	District.	Quantity.	Average per Ton.	Yield of Gold.
	tons cwt. qrs.	ozs. dwts. grs.	ozs. dwts. grs.		tons cwt. qrs.	ozs. dwts. grs.	ozs. dwts. grs.
Bathurst	26,365 0 0	0 8 10·87	11,143 5 21	Bathurst	1,330 0 0	1 14 23·09	2,325 0 0
Tambaroora & Turon	5,320 10 0	1 10 19·27	8,194 9 1	Tambaroora & Turon	6,714 10 0	1 9 4·62	9,800 13 8
Mudgee	10,616 0 0	0 8 1·33	4,276 0 0	Mudgee	5,588 0 0	0 8 13·12	2,388 0 0
Lachlan	330 0 0	0 10 23·27	181 0 0	Lachlan	7,365 5 0	0 9 10·49	3,475 7 11
Southern	506 10 0	0 12 22·68	327 17 0	Southern	645 0 0	0 16 18·33	540 12 20
Tumut and Adelong	8,975 0 0	1 1 11·93	9,646 18 2	Tumut and Adelong	6,060 10 0	1 2 1·95	6,691 4 0
Peel and Uralla	365 0 0	3 3 15·93	1,161 17 8	Peel and Uralla....	337 0 0	2 18 8·33	983 10 0
New England and Clarence	733 0 0	0 15 10·05	565 2 0	New England and Clarence	214 0 0	0 8 14·24	91 19 0
Total	53,211 0 0	0 13 8·20	35,496 9 8	Total	28,254 5 0	0 18 14·73	26,296 6 15

Praiseworthy efforts are being made, both at Hill End and Adelong, to develop our quartz lodes by the introduction of improved appliances and modes of working; and should these efforts be attended with success, they will probably lead to the introduction of improvements on other fields which simply require skill and enterprise to develop their riches.

The following report upon the Back Creek or Barrington Gold Field, furnished by Mr. Licensed Surveyor Pittman, Associate of the Royal School of Mines, London, will doubtless be read with interest by many, and will, it is hoped, attract to that field both labour and capital:—

Back Creek township is situated about 12 miles in a north-westerly direction from Gloucester, and about 5 miles from the Barrington. The area in which the reefs occur is somewhat horse-shoe shaped, being almost surrounded by a mountain range, forming the source and watershed of the southern branch of Back Creek, and having only one break or opening through which the waters of the latter find their way to the Barrington River.

About two years since, the branches of the creek within this area were found to contain alluvial gold, and a rush set in; but the deposits were soon worked out, the bed of the creek being very narrow and in no place extraordinarily rich (several fair sized nuggets were found, the largest weighing, I believe, about 35 ounces). The miners, however, noticed that much of the gold was attached to water-worn fragments of quartz, and they were thus induced—on the alluvial deposits being worked out—to prospect in the surrounding ranges for quartz reefs. It was soon found that reefs existed in great numbers, many of them barren on the surface, but a few giving good prospects when preliminary trials were made. The first gold mining lease was pegged out on the 25th November, 1876, and since then upwards of seventy applications have been made.

The ranges surrounding Back Creek are heavily timbered with box, gum, stringy-bark, and cedar (so that there is a plentiful supply of timber at hand for mining purposes), while the country is in addition covered with an undergrowth of dense vine scrub.

The rocks consist chiefly of blue slate (probably of Devonian age) with Lepidodendron and Calamites, overlaid by conglomerate and a very hard dense blue rock consisting of metamorphosed conglomerate, which Mr. Wilkinson (Government Geologist) informs me is an indication of the proximity of Diorite, almost invariably associated with quartz reefs in New South Wales. I have not however been able to find any dykes of greenstone, though the great irregularity in direction of the reefs would seem to point to an unusual amount of disturbance—probably when mining operations have reached a greater depth it will be found underneath the rock above alluded to. The general dip of the strata is S.E., except on the western side of the field where the rocks dip S.W.

The water supply of this gold field is not by any means a good one. Back Creek is almost dry in the hot season, and the townspeople are dependent for their drinking water on a few small holes. The steepness of the gullies would render the formation of dams an easy matter, were it not for the fact that the surface rocks are exceedingly jointed, and infiltration is consequently very rapid. This appears to me to be one of the greatest drawbacks to the field.

There are two crushing machines on the field. The first was erected several months before Christmas by Messrs. Driscoll and Watt, on the Rainbow Reef. It is fitted with ten head of stamps of 6 cwt. each, and is driven by a movable engine. This machine has crushed about 180 tons of stone from the Rainbow Reef. The other machine, erected by Messrs. Burley and Thomas, on the Town and Country Spur, is now about to commence operations, and being more centrally situated with regard to the upper reefs will probably be kept busy. This machine is fitted for 15 head of stamps, but it is intended to mount only 10 head at first. The engine has a fine fixed boiler 18 feet in length. The proprietors are going to some expense to construct a large dam for supplying the engine with water, and the experiment will be watched with much interest.

The population of the gold field is about 250, of whom about 200 are miners; and, so far, sixteen distinct lines of reef, bearing in all directions, and varying in thickness from a few inches to several feet, have been prospected and pegged out, giving more or less encouraging results.

The reefs now in actual work are—"The Mechanics," "Mountain Maid," "Anderson's," "Hidden Treasure," "Centennial," "Rainbow," "Morning Star," "Lady Lizzie," "Star of the South," "Rose and Thistle," and "Lord of the Hills," and of these the first five show very fair prospects indeed. The only stone as yet crushed by machinery on the field was from the "Rainbow" and "Lord of the Hills" Reefs. Of the former 180 tons yielded 1¼ oz. per ton, while a trial crushing of 10 tons from the latter yielded 9 ozs. of retorted gold.

The stone from these reefs however was not nearly so rich in appearance as is that of some of the other reefs above mentioned. The prospectors of the "Mechanics" Reef have 130 tons of stone at grass, which is confidently expected to yield a much higher return. The prospectors of the "Mountain Maid" Reef have also 100 tons of stone which looks very promising. Altogether there does not appear to be very much stone extracted on the field, considering the time that has elapsed since some of these reefs were first prospected; but certainly the miners have had unusual difficulties to contend with in the way of exceedingly rough country, difficulty in obtaining provisions, &c. Again, the roads for bringing the crushing machines to their destinations were cut by the miners, and latterly they have mostly been engaged in clearing and cutting roads from their claims to the machines.

There appear to be very few claims in the hands of public companies here, most of them being held by *bonâ fide* miners; and of these a great percentage are Newcastle men, who appear to be working their reefs with a will.

The late heavy rains caused a great amount of damage by flooding the shafts, and rendered apparent the disadvantage of working by vertical shafts in a district which, at the first glance, strikes the visitor as eminently suited for tunnelling, by reason of the steep ridges and gullies. During these heavy rains, the soakage from the ranges was sufficient to fill shafts 40 or 50 feet deep in a few hours on account of the very jointed nature of the surface rock. Notwithstanding this, tunnels are at present in a decided minority.

The township of Back Creek now contains four stores and three public-houses, while new buildings are constantly being erected.

From what I have seen of this gold field, I am of opinion that while it is perhaps unlikely to give many extraordinarily rich yields, there is still every reason to believe that it contains a number of reefs from which very fair returns may be expected, and which will afford room for labour and capital for many years to come, and I am inclined to hope that some of the forthcoming crushings will, by improved yields of gold, have the effect of drawing more attention to the field than has hitherto been accorded to it.

Should the mines on the Barrington, Glen Morrison, and Yalwall Gold Fields be worked with energy, and proper appliances for reducing the stone be provided, during 1878, I feel confident the returns from our quartz mines in my next report will exhibit most satisfactory results.

Without desiring to see a revival of the excitement in regard to mining which prevailed during the years 1872-3, it is unquestionably desirable that our gold fields should attract greater attention than they do at present, because there are large tracts of land lying idle and deserted which afford the certainty almost of profitable employment to a very large number of men for an almost unlimited period, and few things would tend to increase the prosperity of the Colony in a greater degree than a large and thriving mining population, because without competing with other producers they are large consumers of produce.

Mr. John Masters, a gentleman who has had very extensive experience as a metallurgist in Victoria and New Zealand, informs me that after having made a number of working experiments in the Western District, he has decided upon erecting at Lucknow suitable machinery and works for the proper treatment of refractory ores and pyrites, and that he proposes to purchase pyrites, blanket-stuff, &c., &c., from miners and others for treatment. The course he proposes to adopt is to sample from the bulk for assay, and upon the result of the assay to offer to purchase the material for cash, and then to treat it on his own account. Mr. Masters states that he will be in a position to give as much for the material as could be got for it in England—the equivalent of the cost of packing and carriage to England representing his profit.

In many cases the material which Mr. Masters proposes to purchase is regarded as waste, owing to the inability of the miners to treat it successfully; and they will not send it to England, because the quantity obtained is too small, or the delays and difficulties are too great. To such the creation of a local market, where they can obtain a fair price without delay, must prove a great boon, and it is to be hoped that it will lead to the profitable working of many mines hitherto regarded as unprofitable, owing to the inability of the miners to extract from the ore the whole of the precious metals.

The following is a list of assays made by Mr. Masters:—

In all the following assays 2,240lb. will represent a ton, and the assay results will show the quantity of gold and silver contained in 1 ton of such ore or sample—

No. 1. Sample of pyritous stone from Dr. Morris's property, at Brown's Creek, Forest Division, Bathurst District, 7 miles from Blayney.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold..............	0 19 14	£4 2 2	£4 3 6
Silver	0 6 12	0 1 4	

There is a really good twenty-stamper battery on this property, with winding gear, tools, &c., &c.; but from the nature of the minerals contained in the lodes, it would be impossible to get more than a very small percentage of the gold by the battery process only—such minerals as these lodes contain requiring a special plant and very careful treatment. This mine and battery has been closed for a considerable time, the stuff crushed not paying at the time the mill was first started. But with proper machinery and correct treatment of the mineral, this mine might be made a most valuable property.

No. 2. Concentrated ore from the above mine; sample taken by myself from mullock tip, crushed and concentrated—10 into 3.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold...............	2 12 6	£10 19 4	£10 19 4
Silver, trace only.			

There appears to be a very large body of this pyritous stone, besides other reefs, in the same property.

No. 3. Samples from same mine as Nos. 1 and 2. This assay was made from several pieces picked from off the mullock heap and assayed in bulk. Not a trace of gold could be seen in the mineral, even after crushing and washing off, until after subjecting it to chemical treatment.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold...............	1 6 3	£5 9 8	£6 4 6
Silver	3 11 20	0 14 10	

The above samples were taken by myself, and show a fine payable result. It is a pity to see so valuable a mine standing idle.

No. 4. Dark mineral, from Shamrock Claim, Lucknow. This mineral was handed to me for assay by H. W. Newman, Esq., of Lucknow; the sample was supposed to be rich in gold.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold..............	0 6 12	£1 7 3	£1 9 11
Silver	0 13 1	0 2 8	

No. 5. Old Forest Reef, Carcoar Division, Bathurst District; sample taken from off tip. In this case a number of pieces of stone highly charged with pyrites and copper mundic were taken and crushed for assay, but no trace of gold could be seen, even after crushing and washing down, until after chemical treatment, showing that special treatment will be required. This will be more apparent when it is known that some five tons were crushed by the ordinary battery process, and less than 3dwts. of gold obtained to the ton.

	ozs, dwts. grs.	Money value.	Total value per ton.
Gold..............	4 1 16	£17 2 11	£17 13 9
Silver	2 12 6	0 10 10	

This mine, 20 acres, after lying idle for over three years, and only lately abandoned, has now been taken up by Messrs. Masters and party, who intend thoroughly testing the mine, and who have erected a special plant for the treatment of the products of this mine (and the minerals from Mr. Morgan's mine, Mitchell's Creek). There is room on this hill for three or four companies who would really work the ground. I fully believe the rich vein of mineral runs through the hill; besides which, there is a very large reef that could be worked for free gold, containing from 6dws. 12grs. to 9dwts. 19grs. of gold, and of the money value by assay of from £1 7s. 3d. to £2 1s. per ton. (*See* Annual Report of Department of Mines, N.S.W. for 1876, page 11, Reports Nos. 7 and 8.) I will willingly give every information I can respecting this ground to any one *bonâ fide* interested in mining.

No. 6. Old Forest Reef. Same reef as No. 5 Assay sample taken by myself from tip at mouth of shaft, crushed, and concentrated, 2 into 1.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold..............	6 10 16	£27 8 9	£17 16 3
Silver	1 15 22	0 7 6	

It will be noticed there is a heavy loss of gold and considerable loss of silver in concentrating this mineral, showing the gold to be in a very fine and divided state, and the silver to be in the form of sulphurets, which metals are very difficult to save in concentration of ore of this class. But this ore is quite rich enough to pay well to work without concentration.

No. 7. Sample sent for assay by R. Adams, Esq., of Sydney; particulars as to locality not known.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold..............	3 11 20	£15 1 8	£17 2 6
Silver	9 16 0	2 0 10	

No. 8. Sample sent for assay by R. Adams, Esq., of Sydney; particulars as to locality not known.

	ozs. dwts. grs.	Money value.	Tocal value per ton.
Gold..............	3 11 6	£14 19 2	£16 17 2
Silver	9 2 22	1 18 0	

No. 9. Sample given for assay by H. W. Newman, Esq., Lucknow; locality, near Lucknow. Sample highly charged with pyrites.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold..............	0 19 14	£4 2 2	£4 12 4
Silver	2 9 0	0 10 2	

No. 10. Sample of cupriferous ore found about 2 miles from Lucknow; mineral highly charged with pyrites; given for assay by Mr. Brown, manager of the "Uncle Tom" Mine, Lucknow.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold..............	0 16 8	£3 8 6	£3 16 0
Silver	1 15 22	0 7 6	

No. 11. Sample from same locality as No. 10, given for assay by Mr. Brown.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold..............	0 9 19	£2 1 0	£2 3 0
Silver	0 9 19	0 2 0	

No. 12. Sample from same locality as Nos. 10 and 11, given for assay by Mr. Brown.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold..............	0 6 12	£1 7 3	£1 9 11
Silver	0 13 1	0 2 8	

No. 13. Morgan's Claim, formerly called Winter and Morgan's Claim, Mitchell's Creek, Bathurst District.

The samples from this wonderful mine are very interesting. This claim has four distinct lodes of different characters.

The first is the most important to Mr. Morgan at present. He is working this lode for gold as a gold mine, and it pays very well as such; but, in reality, it is a very rich auriferous silver lode, and ought to be worked as such; because in working this class of silver ore (chloro-bromide of silver) for silver, he would get as much or even more gold than he saves at present, besides from 80 to 90 per cent. of the silver, which is now run into the tailings heap. It is a splendid ore for pan working requiring no roasting.

What was supposed to be a poor sample of the tailings gave by assay—

	ozs. dwts. grs.		Money value.	Total value per ton.
Silver	25 9 14	at 4/2 per oz.	£5 6 2	£7 7 2
Gold..............	0 9 19	„ 84/- „	2 1 0	

No. 14. Lead lode, on same mine, Mitchell's Creek. This lode is close to and runs parallel to a copper lode; there appears a large body of this mineral, which contains some copper mundic.

	ozs. dwts. grs.	Money value.	Total value per ton.
Silver	13 7 20	£2 13 6	£4 14 6
Gold..............	0 9 19	2 1 0	

No. 15. Copper lode on same mine, Mitchell's Creek. This lode is a very fine one as regards size, but the copper ore is so mixed up with lead ore that it makes it very difficult to work over in the furnace, and on this account very little mining has been done on this vein.

	ozs. dwts. grs.	Money value.	Total value per ton.
Silver	26 5 22	£5 6 4	£8 1 1
Gold..............	0 13 1	2 14 9	

No. 16. Pyrites lode, on same mine, Mitchell's Creek. This is a very important lode, very rich in the precious metals, and about 2 feet 6 inches thick, and quite distinct from the other lodes, being nearly a flat reef running into the hill.

I have purchased 100 tons of this mineral, and am now erecting a plant for the treatment of the same. I have myself fairly sampled this lode, and it assays well.

	ozs. dwts. grs.	Money value.	Total value per ton.
Silver	28 5 3	£5 17 8	£24 7 11
Gold..............	4 8 4	18 10 3	

No. 17. Blayney. Messrs. Wood, Russart, & Co's. claim. This claim is situated about 2 miles from the town of Blayney, and has been worked for copper ore. In sinking a shaft the miners came on the cap of a vein of pyrites containing a little copper mundic—

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold..............	0 6 12	£1 7 3	£2 14 9
Silver	6 10 16	1 7 6	

and I believe it is the intention of the shareholders to follow and investigate this lode further.

The following results of analyses made for this Department by Professor Liversidge, F.C.S., F.G.S., &c., &c., were published in connection with my Report for 1875, but that being now out of print I republish them herewith for the information of those who may desire to treat or may feel interested in the utilization of our waste gold-bearing products :—

AURIFEROUS TAILINGS, &c., &c.

THE following Report contains the result of the chemical determination of the amounts of gold and silver contained in a number of samples of quartz-tailings and other waste gold-bearing products, which were expressly collected from the various gold fields of New South Wales for this investigation, so as to insure that none but fair and impartial samples, as distinguished from mere specimens, were submitted to examination, and that the information obtained with respect to the loss of the precious metals might by that means be made as certain and trustworthy as possible.

In many cases it will be seen that the quantities of gold and silver annually cast away, and in most cases irrevocably lost, are very great indeed. The value thus yearly lost to the Colony must be almost incalculably great.

The necessity for the use of more thorough and scientific methods, similar to those employed elsewhere, is in certain cases most glaringly apparent. Further comment on my part would be superfluous.

It will be seen that the tailings yet collected, and herein reported upon, are for the most part non-pyritous, hence heir thorough and effective treatment should be comparatively simple, easy, and free from expense, and a well advised attempt to recover the gold now left in the waste products should prove a most profitable enterprise.

No. 43.—*Mitchell's Creek, near Bathurst.*

Quartz tailings, composed of rather coarse particles of quartz, mixed with loose powdery oxide of iron. This sample has the appearance of having been calcined; the iron oxide is therefore probably derived from the decomposition of pyrites.

Gold—7 dwts. 4 grns. per ton.
Silver—traces.

No. 44.—*Consols' Engine, Grenfell.*

Quartz tailings of a pale brown colour.

Gold—1 oz. 6 dwts. 18 grns. per ton.
Silver—1 oz. 4 dwts. 4 grns. per ton.

No. 45.—*Mathison's Engine, Grenfell.*

Quartz tailings fine, quartz grains mixed with a bluff-coloured powder.

Gold—3 dwts. 22 grns. per ton.
Silver—traces.

No. 46.—*Slee's Engine, Grenfell.*

Quartz tailings, nearly white in colour.

Gold—3 dwts. 22 grns. per ton.
Silver—traces.

No. 47.—*Victoria Mill, Grenfell.*

Quartz tailings, nearly white in colour.

Gold—1 dwt. 7 grns. per ton.
Silver—traces.

No. 48.—*Vaughan's Engine, Grenfell.*

Quartz tailings, of a yellowish brown colour.

Gold—1 oz. 2 dwts. 22 grns. per ton.
Silver—14 grns. per ton.

No. 49.—*Kirkpatrick's Engine, Grenfell.*

Quartz tailings, mixed with small agglutinated lumps of iron oxide.

Gold—9 dwts. 19 grns. per ton.
Silver—traces.

No. 50.—*Nerrimunga, County of Argyle.*

Quartz tailings, of a greenish colour, mixed with pyrites.

Gold—4 dwts. 13 grns. per ton.
Silver—traces.

No. 51.—*Nerrimunga, County of Argyle.*

Quartz tailings, of a grey colour.

Gold—7 dwts. 19 grns. per ton.
Silver—13 dwts. 2 grns. per ton.

No. 52.—*Nundle, County of Parry.*

Quartz tailings, white in colour.
Gold—6 dwts. 10 grs. per ton.
Silver—traces.

No. 53.—*Nundle, County of Parry.*

Sludge, of a greenish colour, containing friable lumps.
Gold—1 dwt. 7 grs. per ton.
Silver—traces.

No. 54.—*Hill End.*

Quartz tailings, calcined, mixed with iron oxide.
Gold—1 dwt. 7 grns. per ton.
Silver—traces.

No. 55.—*Hill End.*

Quartz tailings, of a brown colour.
Gold—1 dwt. 7 grns. per ton.
Silver—traces.

No. 56.—*Hill End.*

Quartz tailings, roasted, of a brown colour.
Gold—2 dwts. 14 grns. per ton.
Silver—traces.

No. 57.—*Hill End.*

Quartz tailings, of a brown colour.
Gold—3 dwts. 6 grns. per ton.
Silver—traces.

No. 58.—*Hill End.*

Sludge, containing light-coloured subangular argillaceous pebbles, mixed with a little quartz.
Gold—15 grns. per ton.
Silver—traces.

No. 59.—*Hill End.*

Quartz tailings, calcined, mixed with much red oxide of iron.
Gold—2 dwts. 14 grns. per ton.
Silver—traces.

No. 60.—*Clear Creek.*

Quartz tailings, white quartz mixed with other substances giving the tailings a pale brown colour.
Gold—9 dwts. 19 grns. per ton.
Silver—11 oz. 11 dwts. 5 grns. per ton.

No. 61.—*Clear Creek.*

Quartz tailings, pale brown colour, much the same as No. 60.
Gold—8 dwts. 11 grns. per ton.
Silver—12 ozs. 18 dwts. 18 grns. per ton.

No. 62.—*Tumberumba.*

Quartz tailings, white in colour; the quartz particles are very transparent and have a very vitreous lustre, therefore very glassy looking.
Gold—5 dwts. 21 grns. per ton.
Silver—traces.

No. 63.—*Dragon Gold Mining Company. Hill End.*

Quartz tailings, of a brown colour.
Gold—3 dwts. 22 grns. per ton.
Silver—traces.

No. 64.—*Dragon Gold Mining Company. Hill End.*

Blanketting—colour, dark brown.
Gold—7 dwts. 4 grns. per ton.
Silver—13 dwts. 2 grns. per ton.

No. 65.—*Dragon Gold Mining Company. Hill End.*

Waste—a mass of soft white pipeclay.
Gold—1 dwt. 7 grns. per ton.
Silver—traces.

No. 66.—*Excelsior Machine. Tambaroora.*

Quartz tailings, roasted, of a pinkish colour.
Gold—3 dwts. 6 grns. per ton.
Silver—traces.

No. 67.—*Red Hill Machine. Tambaroora.*

Quartz tailings, white in colour.
Gold—7 dwts. 4 grns. per ton.
Silver—traces.

No. 68.—*Independent Machine. Tambaroora.*

Quartz tailings, light brown colour, mixed with a few uncrushed lumps.
Gold—15 grns. per ton.
Silver—traces.

No. 69.—*Sydney and Tambaroora Machine. Tambaroora.*

Quartz tailings, of a pale brown colour.
Gold— 5 dwts. 5 grns. per ton.
Silver—traces.

No. 70.—*South Lead. Forbes.*

Sludge, yellowish brown colour, agglutinated into lumps.
Gold—0 oz. 1 dwt. 7 grns. per ton.
Silver—traces.

No. 71.—*Victoria Lead. Forbes.*

Sludge, clay-coloured, lumpy; much the same as the last.
Gold—0 oz. 4 dwts. 13 grns. per ton.
Silver traces.

No. 72.—*Mathinson's Lead. Forbes.*

Sludge, red-coloured loose clay-like material.
Gold—6 dwts. 10 grns.
Silver—traces.

No. 73.—*Britannia Reef. Forbes.*

Quartz tailings, yellow brown colour.
Gold—1 dwt. 23 grns.
Silver—traces.

No. 74.—*Strickland's Reef. Forbes.*

Quartz tailings, finely divided, brown in colour.
Gold—16 dwts. 23 grns. per ton.
Silver—6 dwts. 11 grns. per ton.

No. 75.—*Williams's Battery. Adelong.*

Quartz tailings, nearly white in colour.
Gold—3 dwts. 22 grns. per ton.
Silver—traces.

No. 76.—*Williams's Battery. Adelong.*

Quartz tailings, same as above.
Gold—1 dwt. 7 grns. per ton.
Silver—traces.

No. 77.—*Braidwood.*

Sludge, principally clay mixed with roots of plants, and containing fragments of quartz leaders.
Gold—3 dwts. 22 grns. per ton.
Silver—traces.

No. 78.—*Braidwood.*

Quartz tailings, calcined.
Gold—8 dwts. 11 grns. per ton.
Silver—traces.

No. 79.—*Burne's Machine. Wiseman's Creek, Oberon.*

Quartz tailings, of a brown colour.
Gold—9 dwts. 3 grns. per ton.
Silver—12 dwts. 9 grns. per ton.

No. 80.—*Lambert and Davies'. Wiseman's Creek, Oberon*

Quartz tailings.
Gold—2 dwts. 14 grns. per ton.
Silver—traces.

No. 81.—*Whelan's Machine. Glenduri, Oberon*

Quartz tailings, in fine state of division, of a light brown colour.
Gold—15 grns.
Silver—traces.

No. 82.—*Long Flat. Major's Creek.*

Gold—1 dwt. 7 grns. per ton.
Silver—traces.

No. 83.—*Big Hill. Major's Creek.*

Quartz tailings, brown in colour.
Gold—1 dwt. 7 grns. per ton.
Silver—traces.

No. 84.—*Spring Creek. Major's Creek.*

Apparently a calcined pyrites, a dark chocolate brown powder.
Gold—17 dwts. 15 grns. per ton.
Silver—1 oz. 12 dwts. per ton.

No. 85.—*Hargraves.*

Quartz tailings, coarse-grained; calcined.
Gold—1 dwt. 7 grns.
Silver—traces.

No. 86.—*Belmore.*

Quartz tailings, almost white in colour.
Gold—6 dwts. 10 grns. per ton.
Silver—19 dwts. 17 grns. per ton.

No. 87.—*Cowra.*

Sludge. An argillaceous sharp gravel; *i.e.*, the fragments are not water-worn.
Gold—15 grns. per ton.

No. 88.—*Tuena.*

Quartz tailings, calcined; of an ordinary brown colour.
Gold—1 oz. 0 dwt. 21 grns. per ton.
Silver—16 dwts. 3 grns. per ton.

No. 89.—*Tuena.*

Tailings, of a greenish gray colour; contains pyrites and a few rounded pebbles.
Gold—3 dwts. 6 grns. per ton.
Silver—traces.

No. 90.—*Tuena.*

Quartz tailings, milky white colour.
Gold—13 dwts. 17 grns. per ton.
Silver—traces.

No. 91.—*Tower Hill Company's Battery. Dalmorton, Little River.*

Quartz tailings, white quartz mixed with a gray powder, probably derived from slate casing or matrix
Gold—1 dwt. 23 grns. per ton.
Silver—traces.

No. 92.—*Lombardy Company's Battery. Solferino.*

Quartz tailings, of a brown colour.
Gold—7 dwts. 20 grns. per ton.
Silver—traces.

No. 93.—*Band of Hope Company. Solferino.*

Quartz tailings, of a very pale brown colour.
Gold—15 grns. per ton.

No. 94.—*Enterprise Battery. Cunglebung, near Dalmorton, Little River.*

Quartz tailings.

Gold—7 dwts. 4 grns. per ton.
Silver—traces.

No. 95.—*Faugh-a-Ballagh Reef. Oberon.*

Quartz tailings, mixed with pyrites.

Gold—1 oz. 15 dwts. 22 grns. per ton.
Silver—7 dwts. 4 grns. per ton.

No. 96.—*King of the West. Trunkey.*

Quartz tailings, of a gray colour, from a depth of 50 to 120 feet.

Gold—4 dwts. 13 grns. per ton.
Silver—traces.

No. 97.—*King of the West. Trunkey.*

A yellow-brown powder; from the discharge shoot, after passing through the amalgamating barrels. Depth 500 feet.

Gold—12 dwts. 9 grns. per ton.
Silver—traces.

No. 98.—*Lady Bowen Machine. Trunkey.*

Quartz tailings, very pale brown colour, from depth of 500 ft.

Gold—1 dwt. 23 grns. per ton.
Silver—traces.

No. 99.—*Trunkey Creek Quartz Mining Company. Trunkey.*

Quartz tailings, of a light brown colour. Depth 300 ft.

Gold—1 dwt. 7 grns. per ton.
Silver—traces.

AURIFEROUS MINERALS.

No. 100.—*Quartz vein. Mitchell's Creek.*

Containing a small amount of iron pyrites and a minute quantity of copper sulphides, both bornite and chalcopyrites being present.

Gold—traces.
Silver—6 oz. 15 dwts. 5 grns. per ton.

No. 101.—*Calcite vein. Armstrong Copper Mine, Wiseman's Creek.*

Massive; large cleavage planes, slightly coloured in parts with green copper carbonate, and in places coated with brown oxide of iron.

Gold—6 grns. per ton.
Silver—5 dwts. 5 grns. per ton.

No. 102.—*Iron Pyrites. Cow Flat, Bathurst.*

From outcrop of lode. Massive, with cubical crystals attached.

Sulphur	27·560
Cobalt	·016
Nickel	none.
Iron, silica, &c.	72·424
	100·000

Gold—4 dwts. 13 grns. per ton.
Silver—traces.

No. 103.—*Iron Pyrites.*

Sulphur	34·44 per cent.
Cobalt	traces. „
Nickel	·16 „
Iron, silica, &c.	65·40 „
	100·00

Gold—2 dwts. 14 grns. per ton.
Silver—traces.

No. 104.—*Iron and Copper Pyrites. Trunkey.*

From newly discovered quartz reef near Trunkey. Reef 18 inches in width.

Metallic copper—10·65 per cent.
Gold—3 dwts. 6 grns. per ton.
Silver—11 dwts. 2 grns. per ton.

No. 105.—*Mispickle. Prince William Mine, Ironbarks, near Orange.*

A compound of iron, arsenic, and sulphur; both the sulphur and the arsenic should be saved during the treatment of this mineral, which contains about 46·0 per cent. of arsenic and 19·0 per cent. sulphur. Contains visible gold.

By assay:—Gold ...	213 ozs.	19 dwts.	8 grns.	per ton.
Free „ ...	4 „	11 „	11 „	„
Total „ ...	218 ozs.	10 dwts.	19 grns.	per ton.
Silver ...	0 „	9 „	3 „	„

No. 106.—*Magnetic Iron Ore. Mount Lambie Iron Mine.*

Massive, finely granular structure. Associated with a chloritic schist.

Gold—1 dwt. 7 grns. per ton.
Silver—none.
Metallic iron—35·62 per cent.

No. 107.—*Magnetic Iron Ore. Carn Creek, Bungonia.*

Massive, finely granular structure

Gold—3 dwts. 6 grns. per ton.
Silver—5 dwts. 5 grns. per ton.

No. 108.—*Granite. Hartley.*

A very compact close-grained granite, composed of dull flesh-coloured orthoclase felspar, quartz, and a little brown-black mica. Contains a small quantity of iron pyrites.

Many different samples of this granite were examined for gold, and in several cases traces both of that metal and of silver were met with; but it was found to be present only in those specimens which contained iron pyrites—the rock itself was proved to be free from gold.

No. 109.—*Granite. Hartley. Obtained from shaft.*

A nearly white, coarse-grained, or porphyritic granite. The felspar is orthoclase, and in part, where crystallized, of a pale dull pink tint; other portions of the felspar are finely granular or powdery, and of a pure white colour. In the rock are small cavities, usually containing quartz crystals and galena; the galena is also disseminated in small quantities through the felspathic portions, but most of it is closely associated with the quartz. In this case, also, the rock itself was found not to contain gold; but where galena was present, traces of gold were met with, and silver was present to the extent of 3 ozs. 8 dwts. 14 grns. per ton.

COAL.

It is gratifying to find that our output of coal is gradually increasing, and that though the quantity shipped to Foreign ports during 1877 is not so large as in 1874 and 1875, it is larger than that of any other year since 1829. While the quantity sent to Intercolonial ports is increasing year by year, and our home consumption shows a very satisfactory rate of increase, as will be seen by reference to the following table of exports and home consumption for the ten years from 1868 to 1877:—

Table showing the quantities and average value per ton of Coal exported to Intercolonial and Foreign Ports respectively, the quantity of Coal consumed in this Colony, and the average price per ton of the total output of the Collieries, from 1868 to 1877 inclusive.

Years.	Exports to Intercolonial Ports.			Exports to Foreign Ports.			Total Exports.			Home consumption.	Total Output and Value.		
	Quantity.	Average per ton.	Value.	Quantity.	Average per ton.	Value.	Quantity.	Average per ton.	Value.		Quantity.	Average per ton.	Value.
	Tons.	£ s. d.	£	Tons.	£ s. d.	£	Tons.	£ s. d.	£	Tons.	Tons.	£ s. d.	£ s. d.
1868	329,052	0 9 5·76	155,975	218,984	0 12 5·29	136,226	548,036	0 10 7·96	292,201	406,195	954,231	0 8 9·08	417,809 0 0
1869	340,466	0 8 9·07	149,059	255,087	0 11 8·31	149,136	595,553	0 10 0·16	298,195	324,221	919,774	0 7 6·32	346,146 0 0
1870	335,564	0 8 6·02	142,656	242,825	0 10 3·57	125,025	578,389	0 9 3·07	267,681	290,175	868,564	0 7 3·54	316,836 0 0
1871	378,891	0 8 6·91	162,470	186,538	0 10 1·22	94,220	565,429	0 9 0·95	256,690	333,355	898,784	0 7 0·47	316,340 0 0
1872	394,052	0 8 8·11	170,947	275,058	0 9 11·46	136,914	669,110	0 9 2·42	307,861	343,316	1,012,426	0 7 9·92	396,198 0 0
1873	425,937	0 12 9·32	272,110	347,142	0 14 7·59	253,979	773,079	0 13 7·32	526,089	419,783	1,192,862	0 11 1·94	665,747 0 0
1874	467,583	0 13 8·30	320,119	405,442	0 15 4·76	312,128	872,980	0 14 5·81	632,247	431,587	1,304,567	0 12 1·37	790,224 0 0
1875	518,853	0 13 7·77	354,074	408,154	0 15 6·64	317,409	927,007	0 14 5·84	671,483	402,722	1,329,729	0 12 3·89	819,429 17 2
1876	542,952	0 13 8·45	372,045	325,865	0 15 6·45	253,166	868,817	0 14 4·70	625,211	451,101	1,319,918	0 12 2·06	803,300 5 6
1877	563,757	0 13 8·64	386,740	351,970	0 14 10·81	262,237	915,727	0 14 2·08	648,977	528,544	1,444,271	0 11 10·74	858,908 8 2
Total	4,207,107	0 11 6·85	2,486,195	3,017,065	0 13 6·31	2,040,440	7,314,127	0 12 4·53	4,526,635	3,930,999	11,245,126	0 10 2·31	5,731,028 10 10

The total output for 1877 exceeds that of 1876 in quantity by 124,353 tons, and in value by £55,698 2s. 8d. The returns furnished show a slight decrease in the average price per ton upon the whole output, and though there is a very slight increase in the price of that shipped to Intercolonial ports, there is a decrease in the average price of coal shipped to Foreign ports.

The report of the Inspector of Collieries (Mr. Thomas Lewis) shows that during 1877 there were thirty-three collieries and four shale mines under inspection, which, as compared with the numbers under inspection during 1876, shows an increase of six collieries and three shale mines.

During 1876 the number of fatal accidents was four, being equal to 1 in 1,041 persons employed in the coal and shale mines, and equal to 1 life for 333,979 tons of coal and shale raised. I am unable to give the figures for 1877 as the Examiner's report has not yet reached me.

According to a table furnished by Mr. Alan Bagot, in his work on "Accidents in Mines," recently published, showing the proportion of lives lost to the number of persons employed in and about the mines, and the quantity of minerals wrought in Great Britain and Ireland in 1876, the number of persons employed is set down at 514,532, the quantity of mineral wrought is 148,989,385 tons, and number of lives lost is 933, equal to the loss of 1 life to every 159,688 tons of mineral wrought or to the loss of 1 life for every 551 persons employed.

So that as regards fatal accidents our mines in 1876 compare very favourably with those of Great Britain, whether in proportion to the number of persons employed or the quantity of mineral wrought. But as it may be urged that our comparative immunity from the effects of explosions of firedamp will account for the smaller proportion of fatal accidents in our mines, I submit that eliminating the lives lost in the mines of Great Britain and Ireland from explosions of firedamp, Mr. Bagot's tables show the loss of 1 life to 177,791 tons of mineral wrought, or 1 life to every 614 persons employed in and about the mines.

It is to be feared that a comparison extending over a number of years would not be so favourable to our collieries. In a valuable article published in the *Sydney Morning Herald*, in June last, from the *Times* of the 27th April, it appears that the proportion of lives lost in the coal mines of Great Britain to the number of persons employed therein during the year 1871 was 1 in 430, which was greater in proportion to the number of men employed than in any of the three previous years; while in the coal and shale mines of this Colony in 1875 the proportion was 1 in 418. There can be little doubt that, taking into consideration all the circumstances of the collieries here and at Home, the proportion of fatal accidents in the former should be much less than in the latter; and that it is not so, must, I fear, be attributed to want of care on the part of the miners.

Taking the figures furnished by Mr. Alan Bagot, we find that the quantity of coal, fireclay, ironstone, and shale (under this head is included alum, shale, pyrites, building stone, &c.), raised from the mines of Great Britain in 1876 is set down at 148,989,385 tons, and the number of persons employed at such mines above ground and under ground is 514,532,—that is to say, 409,229 under ground, and 105,303 (of whom 6,055 were females) above ground; consequently, for each person employed 289·56 tons of mineral was raised during the year.

In 1876 the quantity of coal and shale raised from the mines of this Colony was 1,335,916 tons, and the number of persons employed above ground and under ground was 4,167; consequently, for each person employed about our mines we raised during that year 320·59 tons of mineral; and in 1877 we raised 1,463,234 tons of coal and shale with the aid of 4,722 persons, being equal to 309·87 tons for each person so employed during the year.

In making this comparison it must be borne in mind that besides females, boys between the ages of 10 and 13 years are employed about the mines in Great Britain, whereas in this Colony no females and no boys under 13 years of age are so employed. But in order to make the comparison complete, it would be necessary to ascertain how much time was lost by the persons employed about our collieries and those of Great Britain respectively during each year.

A Company has recently been formed for the purpose of boring for coal near Sydney, for which purpose a diamond-drill has been imported. The works have commenced, and a depth of 220 feet has already been bored, but, as will be seen from the following reports by Mr. C. S. Wilkinson, L.S., F.G.S., the Geological Surveyor, and Mr. Thomas Lewis, the Inspector of Collieries, a much greater depth will probably be reached before a payable seam will be found:—

The Government Geological Surveyor to The Under Secretary for Mines.

Geological Survey of New South Wales.

Sir, Wellington, 17 July, 1876.

I have the honor to acknowledge the receipt of your letter of the 14th instant, requesting me to state, for the information of the Secretary for Mines, my opinion as to what depth coal will be found under Sydney and its suburbs, and to furnish the data upon which my opinion is based.

As to the existence of seams of coal under Sydney there can be but little doubt, but the depth at which they occur can be ascertained only by a careful geological survey, which I have not yet had time to make, and by actual test by boring.

My own geological notes of those portions of the coal districts which I have as yet examined, together with the published observations of the Rev. W. B. Clarke, M.A., F.R.S., and of others who have written on the subject, I have not here with me for reference. I will, however, state generally the geological points to be considered.

The seams of coal in question occur in the Upper Coal Measures. This formation is overlaid by the Hawkesbury rocks, which form those bold sandstone cliffs around Sydney harbour and along the southern coast for about 28 miles from Port Jackson, where, as seen in the hills a short distance inland, these rocks cannot be less than 1,000 feet thick. At this point the coal measures appear at the sea-level and gradually rise, until near Jamberoo they attain an elevation of 1,800 feet, still overlaid by the Hawkesbury sandstones, which are here only about 200 feet thick.

In this splendid coast section we thus see that the Hawkesbury rocks have a thickness of from 200 to 1,000 feet. Now, if we take the northerly dip of 4° of the beds at Coal Cliff to be persistent for 28 miles, the upper coal seam of Illawarra would underlie Sydney at a depth of 7,700 feet, which, with 650 feet of coal measures between the coal seam and the base of the Hawkesbury sandstones, would give the latter a thickness of 7,050 feet below the sea level; this, with the 360 feet of rock above sea-level, as seen in the hills about Sydney, would make at least 7,410 feet as the thickness of the Hawkesbury formation, which is highly improbable. We must therefore arrive at the conclusion that either there must have been enormous denudation of these rocks, amounting to 7,210 feet in the Jamberoo district, and that at Sydney a thickness of 7,700 feet of strata will have to be pierced to reach the uppermost coal seam, or else that this formation is unconformable to the underlying coal measures, in which case the depth of the latter can be ascertained only by boring, for the position of the surface of the coal measures will of course depend upon the amount of upheaval or denudation, or of both, to which the beds were subjected before the deposition of the Hawkesbury sandstone.

But if we take 1,000 feet to be the total thickness of these sandstones, as shown in our Illawarra section, and suppose them to be conformably on the Coal Measures, then it is clear that instead of the dip at Coal Cliff continuing the same for any great distance, the coal beds must "roll" or undulate, and that the coal may occur within 1,250 feet of the surface at Sydney.

Again, at Catharine Hill Bay, near Lake Macquarie, 48 miles north of Sydney, the dip of the coal seams is stated by the Examiner of Coal Fields to be from 1 in 20 to 1 in 30 in a westerly direction. If this dip continue the same as far south as Sydney, the coal will be reached at a depth of about 2,600 feet. But this depth is improbable, for in most of the coal fields the strata frequently "roll," are sometimes faulted and intruded by igneous dikes, and occasionally even within a short distance the dip varies.

It has not yet been determined whether the Illawarra coal seams are the equivalent of those at Newcastle, or whether they are above or below them. I am inclined to regard them as below, judging from the identity of some of the fossil fauna from the marine beds at Wollongong with those from the Hunter River marine series. This is of considerable importance to ascertain, for if the Newcastle coal seams be the uppermost, their southern out-crop will probably be found immediately under the Hawkesbury sandstones in the neighbourhood of Port Jackson; if otherwise, the Illawarra seams will occupy that position.

This consideration at once suggests that the Hawkesbury formation rests unconformably on the Upper Coal Measures, which, I believe, will be confirmed by future observation.

From the scanty information now at our command, perhaps the most instructive is that to be derived from the study of the Hawkesbury sandstones, which a few miles north of Bulli have been observed 1,000 feet in thickness.

If this be their greatest development, then the upper coal measures will be found within 640 feet below the sea-level at Sydney; and if the two formations be conformable, the Bulli coal seam will lie at a depth, as before stated, of about 1,250 feet, but if unconformable the coal measures may lie even nearer the surface, but the position of the coal seams cannot be stated, owing to the varying dip of the beds.

Assuming, therefore, the thickness of the Hawkesbury rocks to be 1,000 feet, whether they be conformable or not to the coal measures, I am of opinion that the coal seams may be met with at a depth of from 600 to 1,500 feet below sea-level in the vicinity of Sydney. To settle this question it would be most desirable that the Government should undertake this exploration, both on account of the valuable scientific information which would be gained, and of the commercial interests attaching thereto.

I may be permitted to suggest that, in contemplation of this exploration by boring being carried out, the Department of Mines should now communicate with the Rock Drill Diamond Boring Company (Limited), in England, and ascertain if they would undertake, and upon what terms, to make borings in this Colony.

I have, &c.,
C. S. WILKINSON, L.-S., F.G.S.
Government Geological Surveyor.

The Inspector of Collieries to The Under Secretary for Mines.

Sir,
Newcastle, 18 July, 1876.

I have the honor to acknowledge the receipt of your letter, dated the 15th instant, requesting me to be good enough to state, for the information of the Honorable Minister for Mines, my opinion as to the depth coal may be found under Sydney and its suburbs, and to furnish the data upon which my opinion is based, and to state in reply,—

1st. I believe that coal may be found at a depth of about 1,500 feet under Sydney and its suburbs.

2nd. However, I must confess that the data upon which I form this opinion are necessarily vague, mainly because it is based on local observations in the districts of Jamberoo and Wollongong only, rather than close examination of the rock formation along the coast between Illawarra and Sydney.

3rd. If the prevailing opinion (in which I share) be correct, viz., that there is a nearly uniform dip of about 1 in 100 in the strata from the Illawarra district to Sydney, then the only conclusion must be clearly in favour of my expressed opinion.

4th. For example, supposing the distance from Jamberoo to Sydney to be about 60 miles, the coal in the Jamberoo ranges is about 1,500 feet above sea-level. At Coal Cliff, about midway between Jamberoo and Sydney, the coal is down at sea-level; consequently, if the dip be the same thence to Sydney the coal must be about 1,500 feet below sea-level at the latter place.

I have, &c.,
THOMAS LEWIS,
Inspector of Collieries.

As some interest has lately been evinced in regard to the depth at which coal can be profitably worked, I shall perhaps be pardoned for inserting here the following tables from Mr. Alan Bagot's work:—

Depth of some of the deepest Collieries in England.

Colliery.	County.	Mineral worked.	Depth in yards.	Depth in feet.
Rosebridge	Lancashire	Coal	815	2,445
Duckenfield*	,,	,,	686	2,058
Monkwearmouth	Durham	,,	580	1,740
Pendleton	Lancashire	,,	526	1,578
Sharlston	Yorkshire	,,	512	1,536
Shire Oaks	Nottinghamshire	,,	510	1,530
Annesley	,,	,,	504	1,512
Ince Hall	Lancashire	,,	600	1,800
Douglas Bank	,,	,,	525	1,575
Lindsey	,,	,,	505	1,515
Worthington	,,	,,	600	1,000
Seaham	Durham	,,	508	1,524
Ryhope	,,	,,	542	1,626

* Reached by incline a total depth of 940 yards = 2,820 feet from the surface.

The following table gives the depths of some of the deepest mines in Europe:—

Country.	Name of Mine.	District.	Mineral worked.	Depth in yards.	Depth in feet.
Austria	Adalbert	Prizibram	Silver and lead	1,093	3,279
Belgium	Viviers	Gilly	Coal	940	2,820
Saxony		Zwickaw	Coal	879	2,637
Prussia	Samon	St. Andre	Silver	844	2,532
Great Britain	Rosebridge	Wigan	Coal	815	2,445
Norway		Konsberg	Silver	623	1,869
Hungary	Amalia	Schmeritz	Gold and silver	590	1,770*
Prussia	Camphausen	Saarbruck	Coal	550	1,650
Spain	La'Luerti	Canada	Silver	516	1,548
Italy	Monte Masio	Gavarrono	Lignite	481	1,443
Sweden	Bersbo		Copper	459	1,377
Pays-bas	Whilhelm	Kerkrade	Coal	364	1,092
Baden		Hagenbruck	Coal	360	1,080
Portugal	Taylor	Palhal	Copper	359	1,077
Bavaria	Max	Stockholm	Coal	286	858
Russia	Turjinsk		Copper	202	606

* The deepest gold mine in Victoria is 1,940 feet.

I venture to republish herewith the results of an investigation of certain samples of coal, made for this Department by Professor Liversidge, F.C.S., F.G.S., &c., &c., in consequence of the Report in connection with which the results were published being now out of print.

NORTHERN DISTRICT.

No. 1.—*Waratah Colliery.*

A good, firm, bright coal, with well-marked lines of lamination, bright layers preponderate. Fracture fairly even, breaking into cuboidal masses. Layers of fibrous "mineral-charcoal," or "mother-of-coal," in between the bright layers; these were also observed in nearly all the other coals.

Specific gravity, 1·303.

	Analysis.	
Moisture	2·21	
Volatile Hydrocarbons	36·70	
Fixed Carbon	55·82	Coke, 59·97 per cent.
Ash	4·15	
Sulphur	1·12	
	100·00	

Coke.—Good, firm, bright and silvery lustre, well swollen up, with small cauliflower-like excrescences.

Ash.—Loose and flocculent, reddish colour, rather paler than No. 7 coal from Australian Agricultural Company's Mine, Newcastle.

No. 3.—*Anvil Creek.*

Structure laminated but compact; not so much mother-of-coal present as in No. 1 (Waratah Mine); breaks into cuboidal masses. Does not readily soil the fingers.

Specific gravity, 1·323.

	Analysis.	
Moisture	1·74	
Volatile Hydrocarbons	41·10	
Fixed Carbon	47·90	Coke, 55·70 per cent.
Ash	7·80	
Sulphur	1·46	
	100·00	

Coke.—Good, firm, bright silvery lustre, not much swollen up.

Ash.—White.

No. 4.—*Russell's Mine.*

Made up of alternate bright and dull laminæ, which merge one into the other irregularly, giving the coal a streaky appearance, quite distinct from the laminated appearance of coal made up of well-defined bright and dull layers. The bright layers have a very brilliant pitchy lustre. Fracture somewhat conchoidal. Does not soil the fingers.

Specific gravity, 1·274.

	Analysis.	
Moisture	1·85	
Volatile Hydrocarbons	44·09	
Fixed Carbon	49·95	Coke, 53·65 per cent.
Ash	2·70	
Sulphur	1·41	
	100·00	

Coke.—Good, firm, bright silvery lustre, with cauliflower-like excrescences.

Ash.—Loose; colour red, but paler than Waratah coal.

No. 5.—*Greta.*

Very similar to No. 1, but with less mother-of-coal; does not soil the fingers; streaky appearance. Fracture conchoidal across the layers.

Specific gravity, 1·287.

	Analysis.	
Moisture	2·25	
Volatile Hydrocarbons	39·21	
Fixed Carbon	54·41	Coke, 57·13 per cent.
Ash	2·72	
Sulphur	1·41	
	100·00	

Coke.—Good, firm, not quite so bright as the former, but rougher in the grain and more swollen up.

Ash.—Loose, buff-coloured.

No. 6.—*Wallsend.*

A bright coal; laminated structure well marked; breaks into irregular cuboidal fragments. Does not soil the fingers readily. Contains a little fibrous mineral charcoal.

Specific gravity, 1·333.

	Analysis.	
Moisture	2·75	
Volatile Hydrocarbons	34·17	
Fixed Carbon	57·22	Coke, 61·86 per cent.
Ash	4·64	
Sulphur	1·22	
	100·00	

Coke.—Much the same as No. 5, but with large cauliflower-like excrescences.

Ash.—Of a pinkish shade, being white mixed with reddish particles.

No. 7.—*Agricultural Company's Mine, Newcastle.*

Very similar to No. 1, but a shade less bright. Breaks into irregular cuboidal fragments. Does not soil the fingers. Contains films of mineral charcoal.

Specific gravity, 1·297.

	Analysis.	
Moisture	2·20	
Volatile Hydrocarbons	32·60	
Fixed Carbon	57·52	Coke, 62·87 per cent.
Ash	5·35	
Sulphur	1·33	
	100·00	

Coke.—A good firm coke, like Nos. 5 and 6, but much more swollen up; very large cauliflower-like excrescences.

Ash.—Heavy, white.

WESTERN DISTRICT.

No. 8.—*Bowenfells.*

Dull lustre, rather strongly laminated; laminæ of bright coal very thin. Does not soil the fingers. Fracture is in parts large conchoidal.

Specific gravity, 1·399.

	Analysis.
Moisture	2·36
Volatile Hydrocarbons	28·35
Fixed Carbon	56·54
Ash	11·40
Sulphur	1·35
	100·00

Coke.—Does not cake; a loose and incoherent black powder left.

Ash.—Dense; white.

No. 9.—*Eskbank.*

A good compact coal; soils the fingers; lustre dull; in parts laminæ not well defined.

Specific gravity, 1·335.

	Analysis.	
Moisture	2·00	
Volatile Hydrocarbons	33·55	
Fixed Carbon	49·97	Coke, 62·88.
Ash	12·91	
Sulphur	1·57	
	100·00	

Coke.—Fair, but rather tender.

Ash.—Brilliant white colour.

No. 10.—*Vale of Clwydd.*

A good compact coal; rather bright on the whole, the bright layers being fairly numerous; fracture irregular; a fresh surface does not soil the fingers.

Specific gravity, 1·323.

	Analysis.	
Moisture	2·10	
Volatile Hydrocarbons	33·35	
Fixed Carbon	53·38	Coke, 63·18 per cent.
Ash	9·80	
Sulphur	1·37	
	100·00	

Coke.—Hard, compact, and fairly lustrous.

Ash.—Very feeble grey tint.

No 11.—*Lithgow Valley.*

Has much the appearance of No. 10, from the Vale of Clywdd. Does not soil the fingers.

Specific gravity, 2·329.

	Analysis.	
Moisture	1·95	
Volatile Hydrocarbons	34·18	
Fixed Carbon	52·34	Coke, 62·46 per cent.
Ash...	10·12	
Sulphur	1·41	
	100·00	

Coke.—Hard, compact and fairly lustrous, about the same as the last.
Ash.—White in colour.

SOUTHERN DISTRICT.

No. 12.—*Mount Kembla.*

A coal of medium brightness, with laminated structure, breaking with a granular surface in places; splits readily along the planes of lamination. The bright layers are tender, and break into small pieces with conchoidal surfaces.

Specific gravity, 1·363.

	Analysis.
Moisture	1·50
Volatile Hydrocarbons	19·74
Fixed Carbon	67·18
Ash	10·72
Sulphur	·86
	100·00

Coke.—Coal does not cake, therefore no true coke formed, a dull black fritted mass left.
Ash.—Brilliant white colour.

No. 13.—*Mount Keira Coal.*

Possesses much the same characters as the last, only soils the fingers rather more readily.

Specific gravity, 1·379.

	Analysis.	
Moisture	1·15	
Volatile Hydrocarbons	23·51	
Fixed Carbon	64·65	Coke, 74·35 per cent.
Ash	9·70	
Sulphur	·99	
	100·00	

Coke.—Hard, fairly lustrous, and much swollen up, with cauliflower-like excrescences.
Ash.—Loose, brilliant white colour.

No. 14.—*Berrima.*

A good firm coal, but more tender than the others. The bright layers present in fair proportion.

Specific gravity, 1·364.

	Analysis.	
Moisture	1·70	
Volatile Hydrocarbons	32·78	
Fixed Carbon	53·84	Coke, 64·24 per cent.
Ash	10·40	
Sulphur	1·28	
	100·00	

Coke.—Bright and lustrous. Very much swollen up.
Ash.—White.

No. 15.—*Dymock's Seam, Jamberoo.*

A firm compact coal; bright and dull layers present in about equal proportion.

Specific gravity, 1·455.

	Analysis.
Moisture	1·50
Volatile Hydrocarbons	20·22
Fixed Carbon	56·56
Ash	20·70
Sulphur	1·02
	100·00

Coke.—Non-caking, therefore no true coke; a black powder merely left.
Ash.—Grey, small in bulk.

TABULAR VIEW OF THE PERCENTAGE COMPOSITION.

Northern District Coal-field.

I.

No.	Name of Colliery.	Moisture.	Volatile hydrocarbons.	Fixed carbon.	Ash.	Sulphur.	Sp. gr.	Coke.
4	Russell's	1·84	44·09	49·95	2·70	1·41	1·274	52·65
5	Greta	2·25	39·21	54·41	2·72	1·41	1·287	57·13
1	Waratah	2·21	36·70	55·82	4·15	1·12	1·303	59·97
6	Wallsend................................	2·75	34·17	57·22	4·64	1·22	1·333	61·86
7	A. A. Co.'s Mine, Newcastle	2·20	32·60	57·52	5·35	1·33	1·297	62·87
3	Anvil Creek............................	1·74	41·10	47·90	7·80	1·46	1·323	55·70

The coals in the above table are arranged in order, according to the amount of ash present—the first of the series containing the smallest, and the last the largest weight of ash. With the exception of the specimen from Anvil Creek, it will be noticed that the proportion of fixed carbon increases with the increase in the amount of ash, the proportions of volatile hydrocarbons naturally undergo a corresponding diminution.

Speaking generally, the coals which yield a large percentage of volatile hydrocarbons may be said to be the best adapted for the manufacture of gas.

It will also be at once apparent that the sp. gr. in most of the above cases affords a very good indication of the quality of the coal. As a general rule, ordinary coals which possess a high specific gravity yield a large proportion of ash.

TABULAR VIEW OF THE PERCENTAGE COMPOSITION.

Western District.

II.

No.	Name of Colliery.	Moisture.	Volatile hydrocarbons.	Fixed carbon.	Ash.	Sulphur.	Sp. gr.	Coke.
10	Vale of Clywdd	2·10	33·35	53·38	9·80	1·37	1·323	63·18
11	Lithgow Valley	1·95	34·18	52·34	10·12	1·41	1·329	62·46
9	Bowenfells	2·36	28·35	56·54	11·40	1·35	1·399	None.
8	Eskbank	2·00	33·55	49·97	12·91	1·57	1·355	63·18

It is noticeable that the quantity of ash yielded by these Western coals is much greater than is yielded by the Northern ones, also that the specific gravity is in certain cases much higher.

The ash in all cases was white and dense, whereas many of the Northern coals yield ashes of a buff or red tint, and often quite loose and flocculent.

It is a common opinion amongst the non-scientific, that the relative amounts of sulphur present in coals can be approximately estimated by the redness of the ash—on the supposition that the whole of the sulphur exists in the coal in the form of iron pyrites—but such is not the case; on referring to the analyses of the Northern District coals, it will be seen that some of the coals which left pure white-coloured ashes contained the largest amount of sulphur, and that others which left red ashes contained the smallest quantity of sulphur.

Sulphur may be present in coals in various forms—either in combination with iron as pyrites, which is the most common form of all; as sulphuric acid, in combination with the inorganic constituents of the coal, such as alumina, lime, magnesia, or potash; or again, it may exist in the form of organic compounds.

TABULAR VIEW OF THE PERCENTAGE COMPOSITION.

Southern District.

III.

No.	Name of Colliery.	Moisture.	Volatile hydrocarbons.	Fixed carbon.	Ash.	Sulphur.	Sp. gr.	Coke.
13	Mount Keira	1·15	23·51	64·65	9·70	·99	1·379	75·35
14	Berrima	1·70	32·78	53·84	10·40	1·28	1·364	64·24
12	Mount Kembla	1·50	19·74	67·18	10·72	·86	1·363	Non-coking.
15	Dymock's, Jamberoo	1·50	20·22	56·56	20·70	1·02	1·456	Non-coking.

The specific gravities of these coals do not in all cases bear that same close relation to the amount of ash which was seen in the case of the coals from the Northern District.

In order that an opinion may be formed with regard to the coals of New South Wales, it will perhaps not be amiss to compare them with some of those produced in various parts of Great Britain.

In the first place, the proportion of ash in a coal is a matter of the greatest importance; the value of coal as a fuel depends to a great extent upon the smallness of the quantity of non-combustible matter which it contains; if the amount be very large the coal will be perfectly worthless. Neither must the quality or chemical composition of the ash be neglected; for if the ashes be easily fusible, as they usually are when a large quantity of iron is present, they tend to "clinker up" the grate, and thus cause great waste of heat and the expenditure of much extra time and labour in stoking.

We have seen that the Northern District coals yield on the average the smallest amount of ash, which is from 2·70 per cent. to 7·80, with an average percentage of 4·57; the Western District coals range from 9·80 to 14·15, and average 11·05 per cent.; and the Southern District coals yield from 9·70 to 20·70 per cent., and average 12·88 per cent. ash.

PERCENTAGE OF ASH.

	Minimum.	Mean.	Maximum.
Northern Coal-fields, of six samples...	2·70	4·57	7·80
Western „ „ four „	9·80	11·05	12·91
Southern „ „ four „	9·70	12·88	20·70

Now, English Newcastle (Northumberland) coking coal contains from 0·79 to 2·49 per cent. ash (see Percy's Metallurgy, vol. 1, p. 99), and averages 1·68. The Nottinghamshire contains 3·9 per cent., and coal from Blaina, South Wales, averages 2·63 per cent. English non-coking coals run rather higher; thus S. Staffordshire coal varies from 1·555 to 6·44, and S. Wales from 1·20 to 7·18; Scotch coals from 1·43 to 6·75; so that, as far as the proportion of ash is concerned, some of our Northern coal is quite equal to the Welsh and Scotch coals, and but little inferior to the English Newcastle coal.

A matter to which we must pay careful attention is the proportion of sulphur present in a coal. The presence of a large amount of this element not only renders the use of the coal unpleasant for domestic purposes, but makes it useless for most manufacturing and metallurgical operations.

The quantity of sulphur existing in New South Wales coals is by no means excessive, and they will in this respect compare not unfavourably with those of other countries.

PERCENTAGE OF SULPHUR.

	Minimum.	Mean.	Maximum.
Northern Coal-fields...	1·12	1·35	1·56
Western „	1·35	1·42	1·57
Southern „	·86	1·06	1·28
Newcastle Coal (England)	·55	·97	1·51

(*Vide* Percy's Metallurgy, Vol. I.)

Playfair and De la Beche found, during their investigation for the English Government, that the mean percentage of sulphur was as follows:—

Welsh coal	1·42	per cent. sulphur.
Derbyshire	1·01	„ „
Lancashire	1·42	„ „
Newcastle	0·94	„ „
Scotland	1·45	„ „

Most of the Secondary and Tertiary coals, on the other hand, contain a larger proportion of sulphur, usually two or three and sometimes as much as 5·0 or 6·0 per cent.

SHALE.

The quantity of kerosene shale raised during 1877 exceeds the output of 1876 by 2,965 tons, and exceeds that of any previous year; but owing to the high price obtained during 1876, the value of the shale raised in that year exceeds the value in 1877 by £1,470.

According to the report of the Inspector of Collieries three new shale mines were opened during the past year, and therefore we may reasonably expect a large increase during 1878 upon previous years. There have been great fluctuations in the output as well as in the value of this mineral, but nevertheless we have, up to the end of 1877, raised 137,299 tons, valued at £371,432.

Table showing the quantity and value of Kerosene Shale produced during the years 1865 to 1877.

Year.	Quantity.	Average price per ton.			Total value.
	Tons.	£	s.	d.	£
1865	570	4	2	5·47	2,350
1866	2,770	2	18	10·48	8,154
1867	4,079	3	14	9·21	15,249
1868	16,952	2	17	7·11	48,816
1869	7,500	2	10	0·00	18,750
1870	8,580	3	4	3·18	27,570
1871	14,700	2	6	3·91	34,050
1872	11,040	2	11	11·91	28,700
1873	17,850	2	16	6·55	50,475
1874	12,100	2	5	1·48	27,300
1875	6,197	2	10	2·22	15,500
1876	15,998	3	0	0·00	47,994
1877	18,963	2	9	0·81	46,524
Total.........	137,299	2	14	1·26	371,432

TIN.

The quantity of tin ore exported during 1877, as exhibited by the following table, shows a very large increase upon the export of tin for 1876. This is most gratifying, as indicating not only that our tin miners possess indomitable perseverance, but that our tin deposits are not likely to be as speedily exhausted as was at one time supposed; and the fact that scarcely any tin ore is now exported shows that the facilities for reducing the ore to fine tin are keeping pace with the output of ore; and when our Northern Railway shall have been extended to the New England district, there is reason to hope that this branch of our mining industry will assume an importance commensurate with the extent and richness of our stanniferous deposits.

The extent of our known tin-bearing country is about 8,500 square miles, or 5,440,000 acres. Of this area only about 8 square miles have up to the present time been actually opened, and but a very small portion of this area has been exhausted, and yet the value of tin already raised amounts to £2,376,066.

Table showing the quantity and value of Tin exported from and the produce of the Colony of New South Wales, since the opening of the Tin Fields in 1872.

Year.	Ingots.				Ore.				Total.			
	Quantity.	Value.			Quantity.	Value.			Quantity.	Value.		
	Tons.	£	s.	d.	Tons.	£	s.	d.	Tons.	£	s.	d.
1872	47	6,482	0	0	849	41,337	0	0	896	47,819	0	0
1873	911	107,795	0	0	3,660	226,641	0	0	4,571	334,436	0	0
1874	4,101	366,189	0	0	2,118	118,133	0	0	6,219	484,322	0	0
1875	6,058	475,168	0	0	2,022	86,143	0	0	8,080	561,311	0	0
1876	5,449	379,318	0	0	1,509	60,320	0	0	6,958	439,638	0	0
1877	7,230	477,952	0	0	824	30,588	0	0	8,054	508,540	0	0
Total...	23,796	1,812,904	0	0	10,982	563,162	0	0	34,778	2,376,066	0	0

During the past year, not only have the miners on our tin fields had to contend against an unprecedented drought, which deprived them in many cases of the means of dressing their ore, but unfortunately the tin market has been so very depressed that the price of ore has occasionally fallen far below what, a short time back and under more favourable circumstances, was considered the cost of raising it, yet in spite of these serious drawbacks our output for the year has exceeded in value half a million sterling.

Though the low price of tin ore cannot be regarded with satisfaction, yet, when viewing the results of the past year, the conviction is forced upon one that it is not an unmixed evil, because but for the reduction in the market value of ore we should scarcely have made such rapid strides in our efforts to reduce the cost of winning and preparing the ore for market, and should the price of ore improve we may hope to reap the reward of our experience gained in times of adversity. If the price should not advance, it is possible the low price may lead to increased consumption, and then our deposits being practically inexhaustible, our hopes for the future will be centred upon the introduction of such further improvements as shall secure a fair margin of profit under the most unfavourable circumstances.

Professor Liversidge, in a report to this Department in 1876, upon some samples of tin tailings submitted to him for examination, says :—

> It is satisfactory to find, that with but one or two exceptions, the value of the tin which is lost in the form of tailings and other waste products is but small in comparison to the loss which is sustained in the treatment of gold-bearing minerals.
>
> But by the introduction of a higher class of machinery than that usually employed for the treatment of tin ores in this Colony, the results obtained would be greatly superior to the present general order of things, and an industry now somewhat unpopular and unremunerative would speedily undergo a complete revolution and change for the better.
>
> Waste products, which contain more than a few hundredths per cent. of metallic tin, should on no account be cast away, but be carefully reserved for subsequent treatment.
>
> Tin ores, which originally only contain 0·5 or one-half per cent. of metal, are found to pay well in Cornwall.

One effect of the fall in the price of tin is certainly much to be regretted, and that is, that in many of our tin mines Chinese has been substituted for European labour—the owners of the mines being, it is assumed, compelled to secure the cheapest labour available, in order to carry on their works with a profit.

It is gratifying to find that the prospecting of lands back some distance from the banks of existing creeks has led to the discovery of ancient river beds containing rich deposits of tin ore. It is also gratifying to be able to report that during the year rich tin lodes have been opened, and are being worked with advantage; this bids fair to form an important branch of tin mining, and in this branch Chinese labour is not likely, for some time to come, to compete with European.

I am glad to be able to report that a very large number of the old tin leases which were not being worked, have been cancelled, and the land thrown open to the miners; in consequence of which, in some districts, the quantity of land applied to lease for tin-mining during 1877 largely exceeds the quantity so applied for in 1876.

Warden Graham (Tenterfield) says—"Tin lode or reef mining is now making great strides and coming prominently into favour with the miners. * * * The demand for mineral lands is still rapidly increasing; the amount of land applied for at the Vegetable Creek office under mineral lease for the year 1876 was 1,360 acres, and for the year 1877 2,760 acres. There was also during 1877 1,420 acres applied for under mineral conditional purchase at the Tenterfield office * * * and 480 acres of land have been applied for under mineral lease during the year 1877 at Maryland."

The following table shows the quantities of tin ore raised on some of the principal tin fields during 1876 and 1877:—

TABLE showing the quantity of Tin Ore raised at some of the principal Mines during the years 1876 and 1877, as shown by the Mining Registrar's returns.

1876.				1877.			
Locality.	No. of Miners.	Ore.	Value.	Locality.	No. of Miners.	Ore.	Value.
		Tons.	£			Tons.	£
Tingha	500	2,300	69,000	Tingha	800	1,800	57,600
Glen Innes...............	120	1,000	30,000	Glen Innes	30	100	3,000
Vegetable Creek.........	625	3,008$\frac{14}{20}$	90,261	Vegetable Creek......	600	1,749	61,215
Tenterfield	407	1,055$\frac{16}{20}$	40,352	Tenterfield	387	1,400	49,000
Tumbarumba	2	12	660	Wilson's Downfall...	630	1,395	48,825
	1,654	7,376½	230,273				
Tenterfield Tin Ingots, 330 Tons.	......	....	22,440				
Total	......	7,376½	252,713	Total...............	2,447	6,444	219,640

The reports furnished by the officers in charge of the Tin Fields are well worthy of perusal, as in addition to the information they convey they display commendable zeal and ability. And the plan of the mines on Vegetable Creek, compiled by Mr. G. H. Gower and attached to his report, is especially valuable to persons interested in that field.

Every effort is being made by the officers of the Department to prepare for publication at an early date locality maps of the Tin fields, in order that the fullest information may be afforded as to what land is open to be taken up for mining purposes. In the meantime tracings have been compiled giving all the information available, and these tracings have been supplied to the local officers, for the use of the public. If when the locality maps are ready the services of the Geological Surveyor can be made available, that gentleman will visit the Tin fields and map out the geological formations, and more especially the position and extent of our stanniferous deposits.

The reports furnished by Mr. Wilkinson (the Geological Surveyor) in 1873 upon the tin fields of New England have proved of immense value to the tin miner, and there can be little doubt that a further investigation by that gentleman, with the aid of suitable maps, will tend in a very great measure to a further if not to the full development of our stanniferous resources.

With increased facilities for bringing the ore to market at a cheap rate, and with improved methods of raising and dressing the ore, our tin deposits present an immense field for the profitable employment of an almost unlimited number of miners. And the climate of the New England district is especially suited to new arrivals from the old country.

The greater part of our tin mines are at present worked on a system of tribute—that is to say, a party of miners raise and dress the ore, for which the owners of the mine pay them at the rate of (say) £28 per ton, more or less. Mines containing lode tin are usually worked by miners who are paid wages, the ordinary rate being about £2 5s. per week.

COPPER.

I have much pleasure in calling attention to the fact that our copper lodes are beginning to attract more attention than formerly, and that as the facilities for smelting and refining become greater our exports of this metal increase. Our cupriferous formations so far as at present known cover about 6,713 square miles, equal to 4,296,320 acres, and it is estimated that the area will be doubled by future discoveries.

Already copper lodes have been tested in various parts of the Colony with, in most cases, satisfactory results, so far as regards the value of the lodes themselves; but in some cases the absence of local smelting works and the expense and difficulty of carting the ore to distant works have retarded operations. With the extension of our railways, lodes which cannot be made to pay at present will probably be extensively and profitably worked.

The following extracts from a report furnished to this Department in 1875, by Professor Liversidge, F.C.S., F.G.S., &c., will convey an idea of the character and value of our copper lodes and the extent of territory through which they are distributed :—

Copper Ores.

No. 20.—*Green Carbonate of Copper. Wiseman's Creek.*

Mixed with the green carbonate are a few patches of the blue carbonate of copper; the ore occurs in a talcose and felspathic vein-stuff possessing a schistose character. Mixed with it is some brown oxide of iron.

Percentage of metallic copper, 16·72.

No. 21.—*Copper Pyrites. Wiseman's Creek, near Bathurst.*

From outcrop of lode.

Percentage of metallic copper, 9·10.

No. 22.—*Copper Pyrites. Wiseman's Creek, near Bathurst.*

Lode 18 ft. thick, depth 100 ft., associated with zinc, blende, quartz, steatite, and asbestos.

Percentage of metallic copper, 11·30.

No. 23.—*Green Carbonate of Copper. South Wiseman's Creek.*

Much the same as No. 20, only richer. A little fluor spar present, which from the presence of numerous fissures filled with blue carbonate of copper, would make a very pretty ornamental stone for inlaid work.

Percentage of metallic copper, 27·06.

No. 24.—*Copper Pyrites. From South Wiseman's Creek.*

Associated with the same minerals as No. 22.

Percentage of metallic copper, 12·78.

No. 25.—*Copper Pyrites. Wellbank, Wellington.*

The tarnished variety, known as "peacock" ore, associated with redruthite (the grey sulphide), bornite or purple ore, and green and blue carbonates.

Percentage of metallic copper, 13·39.

No. 26.—*Red Oxide of Copper. From 10 miles north of Wellington.*

Mixed with the red oxide of copper is native copper, and associated with them are calcite and ferruginous earthy matter.

Percentage of metallic copper, 14·26.

No. 27.—*Mixed Sulphides of Copper. Kadumble Range, Wellington.*

Of the same character as No. 25.

Percentage of metallic copper, 8·98.

No. 28.—*Green Carbonate of Copper. Three-mile Flat, Wellington.*

Deep green colour, minutely mammillated, associated with a red earthy vein-stuff.

Percentage of metallic copper, 13·15.

No. 29.—*Copper Ore. Cargo, near Molong.*

Of complex composition—containing cobalt and other metals. A more detailed analysis will be found under the head of Auriferous Minerals.

The mineral is black, has a dull lustre, gives a shiny streak and a brown powder. Breaks with a fracture, which varies from even to conchoidal. It occurs in veins built up of more or less parallel layers, and is associated with iron pyrites and a little white felspathic matter.

Percentage of metallic copper, 23·16.

No. 30.—*Copper Pyrites. Ophir.*

Associated with a little quartz.

Percentage of metallic copper, 27·49.

No. 31.—*Copper Ore. Mitchell's Creek.*

A gossany-looking ore, in steatitic matrix—containing visible gold (*vide* Gold-bearing Minerals).

Gold equal to 1 oz. 2 dwts. 20 grns. per ton.

Percentage of metallic copper, 12·57.

No. 32.—*Copper Ore. Mitchell's Creek, County of Lincoln.*

A poor looking green carbonate, containing visible gold.

Gold equal to 4 ozs. 10 dwts. 8 grns. per ton.

Percentage of metallic copper, 9·48.

No. 33.—*Red Oxide of Copper. Same locality.*

Dull red colour, high specific gravity, stained with green carbonate on surface.

Contains *gold* equal to 14 ozs. 10 dwts. 6 grns. per ton.

Percentage of metallic copper, 25·79.

No. 34.—*Copper Pyrites. Apsley, near Bathurst.*

Interspersed with thin bands of quartz.
Percentage of metallic copper, 18·72.

No. 35.—*Red Oxide of Copper. Same locality.*

Associated with a talcose schist.
Percentage of metallic copper, 22·82.

No. 36.—*Red Oxide of Copper. Peelwood, North of Tuena.*

A rich massive ore, accompanied with chessylite, the blue carbonate of copper, in well formed crystals, and associated with asbestos.
Percentage of metallic copper, 49·27.

No. 37.—*Copper Pyrites. Same locality.*

A bright looking ore.
Percentage of metallic copper, 21·38.

No. 38.—*Red Oxide of Copper. Bobby Whitlow, Bingera.*

A massive, but dull brick-red ore, coated in parts with green and blue carbonates.
Percentage of metallic copper, 19·94.

No. 39.—*Copper Pyrites. Bingera, New England.*

Mixed sulphides, but principally "peacock" ore, associated with red oxide of iron.
Percentage of metallic copper, 23·71.

No. 40.—*Copper Pyrites. Clarence River.*

Associated with a little quartz.
Percentage of metallic copper, 24·19.

No. 41.—*Red Oxide of Copper. Clarence River.*

Massive.
Percentage of metallic copper, 22·67.

No. 42.—*Copper Pyrites. Clarence River.*

Associated with magnetic iron ore.
Percentage of metallic iron, 15·59.
Do. do. copper, 3·07.

NOTE.—Several of the above samples, in addition to Nos. 31, 32, and 33, contain small quantities of gold; particulars will be found in the separate report upon the Gold-bearing Minerals.

PERCENTAGE COMPOSITION OF COPPER ORES.—TABULAR VIEW.

Oxidized Ores.

No.	Locality.	Description.	Percentage.
26	Near Wellington	Red Oxide	14·26
38	Bingera	„	19·94
41	Clarence River	„	22·67
35	Apsley, Bathurst	„	22·82
33	Mitchell's Creek	„	25·79
36	Peelwood, Tuena	„	49·27
32	Mitchell's Creek	Green Carbonate	9·48
31	„ „	„	12·57
28	Three-mile Flat, Wellington	„	13·15
20	Wiseman's Creek	„	16·72
23	South Wiseman's Creek	„	27·06
	Pyritous Copper Ore.		
42	Clarence River	Pyrites	3·07
27	Kadumble Range, Wellington	Mixed Sulphides	8·98
21	Wiseman's Creek	Pyrites	9·30
22	„ „	„	11·30
24	South Wiseman's Creek	„	12·78
25	Wellbank, Wellington	Mixed Sulphides	13·39
34	Apsley, Bathurst	Pyrites	18·72
37	Peelwood, Tuena	„	21·38
29	Cargo	Mixed Ore	23·16
39	Bingera, New England	Pyrites	23·71
40	Clarence River	„	24·19
30	Ophir Copper Company	„	27·49

Auriferous and Argentiferous Copper Ores.

On examining some of the copper ores for the precious metals, it was found that several of them contained really considerable quantities of both gold and silver. The amount of gold present in three of the richest of them have already been stated in the first part of this report (*vide* Nos. 31, 32, and 33), but for the sake of completeness they are cited again with the others.

There is no reason why most of these ores should not be successfully treated for the extraction of the precious metals which they contain.

It was considered unnecessary to state the amount of silver when less than 1 oz. per ton.

The numbers to these specimens are the same as in the first report.

No. 20.—*Green Carbonate of Copper. Wiseman's Creek.*

Metallic Copper—16·72 per cent.
„ Silver—7 oz. 19 dwts. 17 grns. per ton.
„ Gold—traces.

No. 23.—*Green Carbonate of Copper. South Wiseman's Creek.*

Metallic Copper—27·06 per cent.
„ Silver—21 ozs. 19 dwts. 16 grns. per ton.
„ Gold—traces.

No. 24.—*Copper Pyrites. Wiseman's Creek.*

Metallic Copper—12·78 per cent.
„ Silver—6 ozs. 17 dwts. 4 grns. per ton.
„ Gold—traces.

No. 27.—*Mixed Sulphides of Copper. Kadumble Range, Wellington.*

Metallic Copper—8·98 per cent.
„ Silver—3 ozs. 18 dwts. 9 grns. per ton.
„ Gold—traces.

No. 28.—*Green Carbonate of Copper. Three-mile Flat, Wellington.*

Metallic Copper—13·15 per cent.
„ Silver—8 ozs. 3 dwts. 8 grns. per ton.
„ Gold—traces.

No. 29.—*Mixed Ore. Cargo.*

Metallic Copper—23·16 per cent.
„ Silver—25 ozs. 12 dwts. 20 grns. per cent.
„ Gold—traces.
„ Cobalt—0·43 per cent.
„ Nickel—7·40 „

(For further particulars, *Vide* p. 34.)

Nickel is worth about 10s. 6d. per lb.; hence, roughly speaking, the amount of nickel in a ton of this ore would be worth at least £70. Cobalt is worth about 32s. per lb.

No. 30.—*Copper Pyrites. Ophir.*

Metallic Copper—27·49 per cent.
„ Silver—6 ozs. 0 dwts. 20 grns. per ton.
„ Gold—traces.

No. 31.—*Green Carbonate of Copper. Mitchell's Creek.*

Metallic Copper—12·57 per cent.
„ Silver—13 ozs. 13 dwts. 6 grns. per ton.
„ Gold—1 oz. 2 dwts. 20 grns. „

No. 32.—*Green Carbonate of Copper. Mitchell's Creek, County of Lincoln.*

Metallic Copper—9·48 per cent.
„ Silver—9 ozs. 9 dwts. 19 grns. per ton.
„ Gold—4 ozs. 10 dwts. 18 grns. „

No. 33.—*Red Oxide of Copper. Mitchell's Creek.*

Metallic Copper—25·79 per cent.
„ Silver—1 oz. 11 dwts. 7 grns. per ton.
„ Gold—14 ozs. 10 dwts. 6 grns. „

No. 34.—*Copper Pyrites. Apsley, near Bathurst.*

Metallic Copper—18·72 per cent.
„ Silver—10 ozs. 6 dwts. 10 grns.
„ Gold—traces.

No. 36.—*Red Oxide of Copper. Peelwood, Tuena.*

Metallic Copper—49·27 per cent.
„ Silver—4 ozs. 4 dwts. 22 grns.
„ Gold—traces.

No. 37.—*Copper Pyrites. Peelwood, Tuena.*

Metallic Copper—21·38 per cent.
„ Silver—12 ozs. 11 dwts. 14 grns.
„ Gold—traces.

No. 38.—*Red Oxide of Copper. Bobby Whitlow, Bingera.*

Metallic Copper—19·94 per cent.
„ Silver—1 oz. 2 dwts. 5 grns. per ton.
„ Gold—traces.

No. 42.—*Copper Pyrites and Magnetite. Clarence River.*

Metallic Copper—3·07 per cent.
„ Iron—15·59 „
„ Silver—2 ozs. 15 dwts. 12 grns. per ton.
„ Gold—traces.

No. 110.—*Copper and Iron Pyrites. Armstrong Mine, Wiseman's Creek.*

(From a new lode.)

Metallic Copper—6·16 per cent.
„ Gold—5 dwts. 17 grns. per ton.
„ Silver—2 oz. 15 dwts. 12 grns. per ton.

From the following table it will be seen that our export of copper during 1877 exceeds in value that of 1876 by £74,248; and there is reason to suppose that at the end of the year there were large quantities on hand ready for exportation.

Table showing the quantity and value of Copper, the produce of the Colony, exported from the Colony of New South Wales, from 1858 to 1877:—.

Year.	Ingots.		Ore and Regulus.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£
1858	....	....	58	1,400	58	1,400
1859	30	578	....	....	30	578
1860	....	....	43	1,535	43	1,535
1861	....	....	144	3,390	144	3,390
1862	....	....	213	5,742	213	5,742
1863	23	1,680	114	420	137	2,100
1864	54	5,230	....	....	54	5,230
1865	247	15,820	22	545	269	16,365
1866	255	18,905	23	1,885	278	20,790
1867	393	30,189	2 cwt.	5	393$\frac{1}{10}$	30,194
1868	644	23,297	172	4,000	816	27,297
1869	1,980	74,605	104	2,070	2,084	76,675
1870	994	65,671	6	60	1,000	65,731
1871	1,350	87,579	94	1,297	1,444	88,876
1872	1,035	92,736	417	13,152	1,452	105,888
1873	2,795	237,412	51	1,690	2,846	239,102
1874	3,638	311,519	522	13,621	4,160	325,140
1875	3,520	297,334	157	4,356	3,677	301,690
1876	3,106	243,142	169	6,836	3,275	249,978
1877	4,153	307,181	360	17,045	4,513	324,226
Total	24,217	£1,812,878	2,669	£79,049	26,886$\frac{1}{10}$	£1,891,927

Although we commenced to raise copper ore twenty years back, it may fairly be said, in view of the extent of our deposits, that we have scarcely yet begun to tap our copper lodes ; nevertheless, they have, as indicated by our Customs' returns, already yielded copper to the value of £1,891,927.

The reason that our copper lodes have not been more extensively worked is probably due to the fact that, in most cases, the cost of carrying the ore in the raw state to smelting works has been so great as to deter miners who do not possess the capital necessary to enable them to erect furnaces, or do not possess the skill necessary to enable them to reduce the ore to regulus, from embarking in this branch of mining. As the value of our lodes become better known, and as our lines of railway extend, there can be little doubt that the necessary capital and skill will be forthcoming to develop this important branch of our mineral wealth ; and thus an extensive additional field for the profitable employment of capital and labour will be opened up.

The following statement, kindly furnished to me by George Hardie, Esq., of Sydney, shows the extent and value of our copper lodes towards the North-west extremity of the Colony, and at least 120 miles from any point where our copper lodes have been tested :—

> The only Company carrying on mining operations at Cobar is the "The Great Cobar Copper Mining Company, Limited." This Company is an amalgamation of the "Cobar" and "Southern Cobar" Companies. It comprises 680 acres. The copper lodes now being worked can be traced the entire length of the Company's land. Four shafts have been sunk—three to a depth of 40 fathoms, and one to 60 fathoms ; from each of the shafts quantities of ore are easily obtainable. These shafts prove the lode for over 1,000 feet, and are connected by drives at 15 and 25 fathom levels, ore being obtained throughout the drives. The lode varies from 8 feet to 30 feet in width, and contains carbonates, oxides, black and gray ores, and sulphurets of high percentage. There are six furnaces, four employed in reducing, one in roasting, one in refining. The output of fine copper is about 20 tons per week. About 120 miners are regularly employed, irrespective of wood-cutters, draymen, and contract labourers. The supply of firewood is almost inexhaustible, but timber suitable for mining purposes is difficult to obtain. The Company have splendid fireclay adjoining the mine, and have arranged for all firebricks being made locally in future. The copper has been hitherto forwarded to Bourke, thence to Adelaide for shipment to England—but latterly has been coming to Orange, thence to Sydney. The mine is now well opened out, and will, without further prospecting, provide employment for a large number of miners for years to come. The Company, at considerable cost, have constructed immense tanks, capable of conserving large quantities of water, and after the recent drought no apprehensions are felt on this score. The population of Cobar is now about 500, irrespective of some 300 living within a radius of 20 miles. The Company have now some 400 tons of copper at Bourke awaiting shipment.

IRON.

Under this head I regret to say I am not in a position to afford any information, as reports which were promised have not reached me. I believe satisfactory progress is being made at the Eskbank Ironworks, and that the production of pig and bar iron therefrom will soon make an important addition to our mineral products. I have reason to believe that work has not progressed satisfactorily at the Fitzroy Ironworks during the past year.

The following results of analyses made by Professor Liversidge, F.C.S., F.G.S., &c., were published in connection with my Report for 1875 (now out of print):—

IRON ORES.

No. 16.—*Brown Hæmatite. Manly, near Sydney.*

This specimen of hydrated sesquioxide of iron possessed a somewhat laminated and concentric structure, with small vesicular cavities, many of which were filled with white and yellow clay-like substances.

Specific gravity, rather high.

	Analysis.
Water, hygroscopic	1·600
„ combined	13·770
Silica and insoluble matter	12·660
Sesquioxide of iron	60·720
Phosphorus	traces.
Sulphur	·075
Undetermined	11·175
	100·000

The 60·720 per cent. of sesquioxide of iron is equal to 42·504 of metallic iron. The undetermined constituents consisted chiefly of aluminia, lime, &c. The amounts of sulphur and phosphorus are small.

No. 17.—*Limonite. Eskbank.*

A variety of brown hæmatite, commonly known as "clay band iron ore," occurring interbedded with the coal measures. The masses often possess an irregular cuboidal form, and sometimes are seen to contain cavities, usually more or less filled with yellow ochre, and closely answering in shape to the external form.

	Analysis.
Water, hygroscopic	1·730
„ combined	13·560
Silica and insoluble matter	13·520
Sesquioxide of iron	66·320
Phosphorus	traces.
Sulphur	·192
Undetermined	4·678
	100·000

The 66·320 per cent. of sesquiozide of iron is equal to 46·424 per cent. of metallic iron.

No. 42.—*Magnetic Iron Ore. Clarence River.*

Found associated in a mineral vein with copper pyrites.
Percentage of metallic iron, 15·59.

SILVER AND LEAD.

The quantity of silver exported during 1877 is only 31,409 ozs., valued at £6,673, and of lead 20 tons 12 cwt., valued at £325. There are mines in the Colony which should, with skilled labour and proper appliances, pay well, and it is to be hoped that in due time they will receive the attention they merit. Samples of silver and lead ore were obtained by Mr. Warden Smith from Peelwood, and were sent to the Department during the year.

ANTIMONY, &C.

During 1877 about 56 tons of antimony ore, and 13 tons 13 cwt. of the metal, valued at £1,131, were exported. There is evidently a desire at the present time to devote more attention to this mineral. The following extracts from papers by Professor Liversidge, F.C.S., F.G.S., &c., are therefore given:—

Native Antimony.

I can find no authentic record of the occurrence of native metallic antimony in New South Wales, although I believe it has been met with in New England and elsewhere.

Antimonite. Pyramul.

In splendid massive blocks, showing well-developed striated cleavage planes; exterior coated with the yellow coloured oxide of antimony (SbO_4), known as cervantite.

Metallic Antimony	67·74 per cent.
Gold	traces.
Silver	traces.

Antimonite.—Chem. Com.: antimony sulphite$=Sb_2S_3$.

$Sb=71{\cdot}8$; $S=28{\cdot}2=100$.

This ore is met with in the massive state in mineral veins, and occasionally in rolled masses; crystals appear to be rare.

It occurs on the Clarence and Paterson Rivers, the mineral occuring in masses of large size, and showing broad, well-defined, striated cleavage planes, portions of the surface usually being incrusted with a yellow coating of cervantite, an oxide of antimony$=SbO_4$.

It is found associated in many parts of New England with tin stone, molybdenite, wolfram, and other minerals.

Localities.—Tenterfield, Armidale, Gresford, Rylstone, Rocky River, Grafton, Macleay, and Hastings Rivers, near Mt. Mitchell, Boorolong, Gara, Drake, Nundle Gold Field, Solferino, Wallerawang, Gundagai, Shoalhaven River, Eden, Twofold Bay.

The Rev. W. B. Clarke records finding a rolled mass on the North Shore.

Cervantite.

Chem. Comp.: Antimony oxide$=SbO_4$. $Sb=79{\cdot}2$; $O=20{\cdot}8=100$.

Usually occurs massive, as an incrustation upon antimonite, sometimes as minute circular crystals of a dull yellow colour.

Localities.—Almost the same as those for antimonite, as at Gwyra near Armidale, Pyramul, and other places.

Jamesonite.

Chem. Comp.$=2\ (PbFe)\ S + Sb_2\ S_3$.
Sulphur, 21·1; antimony, 32·2; lead, 43·7; iron, 30=100.
This mineral usually occurs in fibrous masses of a bluish lead-gray colour.
It occurs with cervantite in a soft quartz near to Campbell Creek and Nuggety Gully, Bathurst District.

Inquiries have been made from time to time respecting Asbestos and Talc; the following extracts from Mr. Warden Smith's report may therefore prove of interest:—

Asbestos has been found on Mrs. Stanley's farm, near Tea-pot Swamp, and also on Crown Lands at Thompson's Gully, Sewell's Creek, about 5 miles from Rockley.

The sample of asbestos that I sent you was obtained on Mrs. Stanley's farm, near Back Creek Railway Station. I have no doubt that a good sample, say 50 lbs., could be obtained.

The soap stone is not as good as could be obtained, and is taken from the surface; a foot or so underground the stone can be cut with a knife or saw. The talc was obtained from same neighbourhood as the soap stone.

SUMMARY.

In conclusion, I have the honor to submit a summary of the quantity and value of the various minerals produced, the aggregate value to the 31st December last being £46,439,130 1s. 5d.:—

	Quantity.	Value.			Total Value.		
		£	s.	d.	£	s.	d.
Quantity and value of gold raised prior to the 1st January, 1877	8,603,526·30 ozs.	32,027,130	16	3			
Quantity and value of gold raised during 1877...	124,110·53 „	471,418	4	4			
Totals	8,727,636·83 ozs.	32,498,549	0	7	32,498,549	0	7
Quantity and value of silver raised prior to the 1st January, 1877	402,970 ozs.	105,466	0	0			
Quantity and value of silver raised during 1877	31,409 „	6,673	0	0			
Totals	434,379 ozs.	112,139	0	0	112,139	0	0
Quantity and value of coal raised prior to the 1st January, 1877	16,036,926 tons.	8,278,058	2	8			
Quantity and value of coal raised during 1877...	1,444,271 „	858,998	8	2			
Totals	17,481,197 tons	9,137,056	10	10	9,137,056	10	10
Quantity and value of shale raised prior to the 1st January, 1877	118,336 tons	324,908	0	0			
Quantity and value of shale raised during 1877	18,963 „	46,524	10	0			
Totals	137,299 tons	371,432	10	0	371,432	10	0
Quantity and value of tin raised prior to the 1st January, 1877	Ingots 16,559⅒ tons Ore 10,131¾ „	1,867,410	0	0			
Quantity and value of tin raised during 1877	Ingots 7,230 „ Ore 824 „	508,540	0	0	2,375,950	0	0
Quantity and value of copper raised prior to the 1st January, 1877	Ingots 15,925 tons 9cwt. Ore 22,206 „ 16 „ Regulus 114 „ 5 „	1,566,232	0	0			
Quantity and value of copper raised during 1877	Ingots 4,152 „ 15 „ Regulus 360 „ 7 „	324,226	0	0	1,890,458	0	0
Value of iron raised prior to 1st January, 1877..	....	29,335	0	0			
Quantity and value of iron raised during 1877..	2,600 tons	7,600	0	0	36,935	0	0
Quantity and value of antimony raised prior to the 1st January, 1877	Ore 112 tons Regulus 142 „	6,037	0	0			
Quantity and value of antimony raised during 1877	Ore 55 „ 19 cwt. Metal 13 „ 13 „	1,131	0	0	7,168	0	0
Quantity and value of lead raised prior to the 1st January, 1877	67 tons	1,392	0	0			
Quantity and value of lead raised during 1877...	20 „ 12 cwt.	325	0	0			
	87 tons 12 cwt.	1,717	0	0	1,717	0	0
Mixed minerals raised during 1877	231 tons	7,725	0	0	7,725	0	0
Total	....	....			46,439,130	1	5

The aggregate value of the minerals raised during the year 1877 amounts to £2,233,161 2s. 6d., as compared with £2,183,095 13s. 3d. for 1876, showing an increase for 1877 of £50,065 9s. 3d.; and as compared with the decennial average, namely, £2,060,032 7s. 0·9d., the aggregate value for 1877 shows an increase of £173,128 15s. 5·1d.

I have, &c.,
HARRIE WOOD,
Under Secretary for Mines.

Department of Mines, Sydney, 15th April, 1878.

MEMO.—I have much pleasure in inviting attention to the Report of the Examiner of Coal Fields, which contains valuable sections and interesting details respecting some of the collieries.—H.W 19/4/78.

TABLE showing approximately the Number of Miners employed in gold mining, the quantity of gold won, the area of ground worked, and the value of machinery, in the Colony of New South Wales, during the Year 1877.

District and Division.	Alluvial Miners.		Quartz Miners.		Total Miners.	Quantity of Gold.			Price of Gold per ounce.		Value of Gold won.	Alluvial ground worked.	Quartz Reefs proved to be auriferous.	Value of Machinery.
	Europeans.	Chinese.	Europeans.	Chinese.		Alluvial.	Quartz.	Total.	From.	To.				
	No.	No.	No.	No.	No.	ozs. dwt. grs.	ozs. dwt. grs.	ozs. dwt. grs.	s. d.	s. d.	£ s. d.	Square miles.	No.	£
BATHURST DISTRICT—														
Bathurst Division ...	25	50	10	20	105	85 0 0	100 0 0	185 0 0	70/0	77/6	690 0 0	...	...	...
Trunkey " ...	38	5	18	...	61	870 7 0	436 10 0	1306 17 0	74/0	74/6	4236 2 0	...	...	7040
Tuena " ...	35	50	6	...	91	653 0 0	150 0 0	803 0 0	72/0	75/0	3075 0 0	20	15	5500
Carcoar " ...	50	6	50	...	106	1243 11 19	1800 0 0	3043 11 19	60/0	77/6	9891 13 6	...	...	6700
Cowra " ...	20	...	...	...	20	78 0 0	....	78 0 0	75/0	...	292 11 0	1	...	......
Oberon " ...	2	...	...	...	2	....	....	....	...	...	....	...	...	750
Rockley " ...	29	22	...	...	51	335 0 0	....	335 0 0	71/0	74/0	1206 0 0	5	...	......
Orange " ...	...	...	...	...	46	....	....	6494 0 0	65/0	70/0	21918 0 0	...	...	4000
Mitchell's Creek Division.	15	19	24	...	58	100 0 0	132 0 0	232 0 0	40/0	70/0	614 0 0	160	12	3000
	214	152	108	20	540	3364 18 19	2618 10 0	12477 8 19	40/0	77/6	41923 6 6	186	27	26990
TAMBAROORA AND TURON DISTRICT—														
Hill End Division ...	157	237	281	...	675	....	....	20433 2 6	70/0	77/6	79178 6 3	40	4	40285
Sofala " ...	209	178	100	...	487	....	....	5326 18 20	74/6	...	19842 15 0	...	75	3505
Ironbarks " ...	150	100	100	...	350	....	... .	900 0 0	70/0	80/0	3375 0 0	144	20	5000
	516	515	481	...	1512	....	....	26760 1 2	70/0	80/0	102396 1 3	184	99	48790
MUDGEE DISTRICT—														
Gulgong Division	250	25	...	...	275	11461 8 11	....	11461 8 11	70/0	77/6	42970 6 8	9	7	3100
Mudgee "	65	...	...	...	65	7401 8 5	....	7401 8 5	73/6	77/6	27755 0 0	...	...	1050
Hargraves "	104	100	...	...	204	2166 9 20	....	2166 9 20	72/0	76/0	8015 15 10	40	10	1750
Wellington "	62	45	60	...	167	739 19 9	2388 0 0	3127 19 9	70/0	...	10948 0 0	...	2	8000
	481	170	60	...	711	21769 5 21	2388 0 0	24157 5 21	70/0	77/6	89689 2 6	49	19	13900
LACHLAN DISTRICT—														
Forbes Division	60	...	50	...	110	368 4 0	869 18 0	1238 2 0	72/0	77/6	4683 6 1	120	20	6000
Parkes "	400	...	30	...	430	3068 5 1	500 0 0	3568 5 1	73/0	76/0	13915 8 0	10	20	6290
M'Guigan's Sub-Division	200	...	...	...	200	3656 18 18	624 10 0	4281 8 18	...	75/0	16050 18 3	90	3	2000
Cargo Division	40	...	35	...	75	1000 0 0	2100 0 0	3100 0 0	70/0	74/0	11160 0 0	1	13	2500
Grenfell "	26	...	52	...	78	520 0 0	930 0 0	1450 0 0	72/0	78/0	5365 0 0	...	...	5050
Young "	150	50	...	...	200	818 17 6	....	818 17 6	75/6	76/0	3101 8 10	200	11	1700
	876	50	167	...	1093	9432 5 1	5024 8 0	14456 13 1	70/0	78/0	54276 1 2	421	67	23540

TABLE showing approximately the Number of Miners, &c.—*continued.*

District and Division.	Alluvial Miners.		Quartz Miners.		Total Miners.	Quantity of Gold.			Price of Gold per ounce.		Value of Gold won.	Alluvial ground worked.	Quartz Reefs proved to be auriferous.	Value of Machinery.
	Europeans.	Chinese.	Europeans.	Chinese.		Alluvial.	Quartz.	Total.	From.	To.				
	No.	No.	No.	No.	No.	ozs. dwts. grs.	ozs. dwts. grs.	ozs. dwts. grs.	s. d.	s. d.	£ s. d.	Square miles.	No.	£
SOUTHERN DISTRICT—														
Braidwood Division......	100	50	...	...	150	1040 9 17	....	1040 9 17	73/0	75/0	3850 0 0	...	...	7000
Araluen „	229	92	4	8	333	4846 5 12	253 4 12	5099 10 0	68/0	75/9	19059 18 2	...	...	19030
Major's Creek „	84	490	37	1	171	1828 0 4	287 8 8	2115 8 12	70/0	74/0	7755 1 4	...	20	2355
Little River „	130	118	...	...	248	2400 0 0	....	2400 0 0	...	...	9240 0 0	...	...	555
Nerrigundah „	60	45	5	...	110	918 16 21	72 9 0	991 5 21	67/0	78/6	3849 3 3	3	8	400
Shoalhaven „	...	...	20	...	20	....	88 0 0	88 0 0	...	72/6	319 0 0	1	4	800
Moruya „	30	...	...	...	30	175 10 12	....	175 10 12	...	...	674 6 5	...	...	2000
Bombala „														
Cooma „	...	...	...	...	11	....	....	877 0 0	75/0	78/0	3388 0 0	...	...	......
	633	354	66	9	1073	11209 2 18	701 1 20	12787 4 14	70/0	78/6	48135 9 2	4	32	32140
TUMUT AND ADELONG DISTRICT—														
Adelong Division.........	150	50	150	...	350	7020 8 2	6279 17 5	13300 5 7	...	...	52360 0 0	100	7	12000
Reedy Flat „	...	...	...	...	...	....	....	....	...	...	....	...	...	......
Tumut „	39	7	...	...	46	429 12 0	....	429 12 0	64/0	74/0	1502 0 0	12	...	2000
Gundagai „	4	...	12	...	16	20 0 0	305 0 0	325 0 0	...	...	1220 15 0	...	...	6000
Yass „	...	...	...	...	14	....	....	18 0 0	70/0	75/0	65 5 0	...	1	50
Tumbarumba „	241	30	40	...	311	2221 13 11	1831 4 0	4052 17 11	75/0	76/0	14332 13 2	25	10	27620
Kiandra „	80	106	...	...	186	1367 0 0	....	1367 0 0	70/0	72/0	4784 10 0	2½	3	2750
Yarrara „	6	10	2	...	18	45 0 0	61 15 12	106 15 12	68/0	81/10	403 1 5	8	25	5620
Albury „	...	...	15	...	15	....	....	....	...	...	....	...	...	......
Queanbeyan „	...	...	7	...	7	....	23 3 9	23 3 9	...	77/10½	89 5 0	...	2	300
Gunning „	...	...	...	...	...	....	....	....	...	...	....	...	...	......
Wagga Wagga „	...	...	...	...	11	....	....	176 0 0	70/0	75/0	638 0 0	...	...	......
	520	203	226	...	974	11103 13 13	8501 0 2	19798 13 15	70/0	81/10	75395 9 7	165½	48	56340

TABLE showing approximately the Number of Miners, &c.—*continued.*

District and Division.	Alluvial miners.		Quartz Miners.		Total Miners.	Quantity of Gold.			Price of Gold per ounce.		Value of Gold won.	Alluvial ground worked.	Quartz Reefs proved to be auriferous.	Value of Machinery.
	Europeans.	Chinese.	Europeans.	Chinese.		Alluvial.	Quartz.	Total.	From.	To.				
	No.	No.	No.	No.	No.	ozs. dwt. grs.	ozs. dwt. grs.	ozs. dwt. grs.	s. d.	s. d.	£ s. d.	Square miles.	No.	£
PEEL AND URALLA DISTRICT—														
Armidale Division........	50	35	3	...	88	400 0 0	27 10 0	427 10 0	72/0	75/0	1570 1 0	...	3	1000
Uralla ,, ...	...	...	...	...	81	....	....	700 0 0	75/6	76/0	2626 0 0	20	...	300
Nundle ,, ...	30	70	50	...	150	900 0 0	2000 0 0	2900 0 0	72/0	73/0	10485 0 0	...	...	4500
Scone ,, ...	...	...	37	...	37	....	300 0 0	300 0 0	...	72/6	1087 0 0	...	5	2000
Barraba ,, ...	22	2	20	...	44	350 0 6	65 0 0	415 0 6	70/0	71/0	1225 0 0	12	6	700
Bingera ,, ...	53	4	...	...	57	700 0 0	....	700 0 0	70/0	72/0	2400 0 0	10	2	600
Glen Innes ,, ...	...	...	...	...	47	....	....	41 9 6	...	...	....	...	...	......
Walcha ,, ...	...	...	13	...	13	....	716 4 0	716 4 0	71/0	72/0	2561 2 0	1	3	2000
Nowendoc ,, ...	...	...	...	...	...	....	....	....	...	...	....	...	...	......
Barrington ,, ...	50	...	200	...	250	150 0 0	436 0 0	586 0 0	67/6	72/0	2051 0 0	3	17	1300
Inverell ,, ...	...	...	...	...	...	....	....	....	...	...	....	...	...	......
Tamworth ,, ...	...	...	...	...	...	....	....	1141 0 0	...	72/6	4135 0 0	...	...	......
	205	111	323	...	767	2500 0 6	3544 14 0	7927 3 12	67/6	75/0	28140 3 0	46	36	12400
NEW ENGLAND AND CLARENCE DISTRICT—														
Tenterfield Division......	10	25	...	...	35	2309 0 0	....	2309 0 0	60/0	64/0	6927 0 0	23	11	1800
Little River ,, ...	6	...	6	...	12	....	....	....	...	...	....	...	...	5000
Lunatic ,, ...	70	60	50	...	180	500 4 18	374 13 18	874 18 12	70/0	77/0	3041 18 0	...	100	1000
(Solferino) Lionsville... Division.	16	2	14	...	32	186 3 15	39 0 0	225 3 15	68/0	72/0	787 2 8	80	21	5640
Ballina Division	39	...	...	...	39	2500 0 0	....	....	65/0	68/0	5700 0 0	...	...	......
Dalmorton ,, ...	6	...	...	...	6	150 0 0	....	150 0 0	...	70/0	562 0 0	...	...	......
Wilson's Downfall	...	...	...	...	...	....	....	....	...	...	....	...	...	......
	147	87	70	...	304	5645 8 9	413 13 18	3559 2 3	60/0	77/0	17018 0 8	103	132	13440

Summary.

TABLE showing approximately the number of Miners employed in gold mining, the quantity of gold won, the area of ground worked, and the value of machinery, in the Colony of New South Wales, during the year 1877.

District and Division.	Alluvial Miners.		Quartz Miners.		Total Miners.	Quantity of Gold.			Price of Gold per ounce.		Value of Gold won.	Alluvial ground worked.	Quartz Reefs proved to be auriferous.	Value of Machinery.
	Europeans.	Chinese.	Europeans.	Chinese.		Alluvial.	Quartz.	Total.	From.	To.				
	No.	No.	No.	No.	No.	ozs. dwt. grs.	ozs. dwt. grs.	ozs. dwt. grs.	s. d.	s. d.	£ s. d.	Square miles.	No.	£
Bathurst District	214	152	108	20	540	3364 18 19	2618 10 0	12477 8 19	40/0	77/6	41923 6 6	186	27	26990
Tambaroora and Turon District.	516	515	481	...	1512	....	....	26760 1 2	70/0	80/0	102396 1 3	184	99	48790
Mudgee District.........	481	170	60	...	711	21769 5 21	2388 0 0	24157 5 21	70/0	77/6	89689 2 6	49	19	13900
Lachlan „	876	50	167	...	1093	9432 5 1	5024 8 0	14456 13 1	70/0	78/0	54276 1 2	421	67	23540
Southern „	633	354	66	9	1073	11209 2 18	701 1 20	12787 4 14	70/0	78/6	48135 9 2	4	32	32140
Tumut and Adelong District.	520	203	226	...	974	11103 13 13	8501 0 2	19798 13 15	70/0	81/10	73395 9 7	165½	48	56340
Peel and Uralla District.	205	111	323	...	767	2500 0 6	3544 14 0	7927 3 12	67/6	75/0	28140 3 0	46	36	12400
New England and Clarence District.	147	87	70	...	304	5645 8 9	413 13 18	3559 2 3	60/0	77/0	17018 0 8	103	132	13440
	3592	1642	1501	29	6974	65024 14 15	23191 7 16	121923 12 15	40/0	81/10	456973 13 10	1158½	460	227540

TABLE showing approximately the number of Miners employed in mining for Minerals other than Gold or Coal, the quantity won during the year 1877, and the value of same, and the value of the plant.

Locality.	Miners employed.	Quantities.				Value.	Value of Machinery.	Remarks.
		Tin.	Copper.	Iron.	Antimony.			
		Tons.	Tons.	Tons.	Tons.	£	£	
Bathurst	100	....	3,756	....	....	11,849	1,750	Ore.
Tuena	70	....	302	....	....	15,100	3,000	Regulus.
Oberon	20	....	1,042	....	....	3,715	750	Ore.
Bourke	120	....	1,040	....	....	62,400	....	Copper.
Gundagai	20	....	164	....	....	3,854	600	Regulus.
Bingera	4	....	150	....	....	525	....	Ore.
	334	....	6,454	....	....	97,443		
Tingha	800	1,800	....	....	....	57,600	7,000	Ore.
Glen Innes	30	100	....	....	....	3,000	....	Ore.
Tenterfield	387	1,400	....	....	....	49,000	850	Ore.
Vegetable Creek	600	1,749	....	....	....	61,215		
Wilson's Downfall ...	630	1,395	....	....	....	48,825		
	2,447	6,444	....	....	....	219,640		
Berrima	30	....	....	1,600	....	7,200	....	Ore. At work only for first three months of the year.
Hartley	......	....	....	700	....	350	....	Ore.
Bathurst	......	....	....	300	....	50	....	Ore.
	30	....	....	2,600	....	7,600		
Lunatic	......	....	....	....	47	564	....	Ore.

The following information has been obtained by the Wardens and Mining Registrars respecting certain parcels of Wash-dirt which have been puddled, sluiced, or crushed during the Year 1877, and the quantity of Gold produced therefrom.

District and Division.	Name of Company.	Locality.	Quantity.	Average yield of Gold per ton.	Total yield of Gold.	Depth of Workings.
			Tons.	ozs. dwts. grs.	ozs. dwts. grs.	
Bathurst District— Carcoar Division	C. Hendricks & Co.	Forest Reefs, Lumpy Swamp.	2,054	0 10 0·00	1,027 0 0	100 ft.
	Brown's Creek G. M. Co.	Brown's Creek	19,571	0 1 12·22	1,477 0 0	90 „
			21,625	0 2 7·58	2,504 0 0	
Tambaroora and Turon District— Ironbarks Division	Medway & Co.	Little Ironbarks	300	0 8 0·00	120 0 0	90 ft.
	Varco & Co.	„	57	0 5 0·00	14 5 0	„
	Daly & Co.	„	17	0 17 0·00	14 9 0	„
	„	„	7	0 7 0·00	2 9 0	„
	„	„	22	1 1 19·63	22 2 0	„
	Williams & Co.	„	1,000	0 0 7·76	16 3 8	surface.
	Marshall & Co.	„	200	0 6 16·00	66 13 8	90 ft.
	Miller & Co.	„	18	0 6 0·00	5 8 0	„
	„	„	20	1 0 0·00	20 0 0	„
	„	„	33	0 10 0·00	16 10 0	„
			1,674	0 3 13·44	297 19 16	
Mudgee District— Wellington Division	Kaiser	Mitchell's Creek	1,160	0 3 0·00	174 0 0	65 ft.
			1,160	0 3 0·00	174 0 0	
Lachlan District— Forbes Division	Walcott & Co.	Old Mathieson's Lead	200	0 9 0·00	90 0 0	tailings, &c.
	Mathieson & Co.	Bald Hills, near Forbes	220	0 17 17·45	195 0 0	
Grenfell „	Doyle & Co.	Seven-mile	80	0 10 0·00	40 0 0	90 ft.
	Dodd & Co.	Quandong Gully	325	0 4 14·76	75 0 0	200 „
	Peters & Co.	Milkman's Gully	150	0 4 22·40	37 0 0	150 „

YIELD of Gold from Wash-dirt—*continued.*

District and Division.	Name of Company.	Locality.	Quantity.	Average yield of Gold per ton.	Total yield of Gold.	Depth of Workings.
			Tons.	ozs. dwts. grs.	ozs. dwts. grs.	
LACHLAN DISTRICT—*contd.*						
Forbes Division	George Draper	Bushman's Lead	2,000	0 0 6·00	25 0 0	
	Bowman & Nichols	No Mistake	500	0 4 0·00	100 0 0	90 ft.
	J. Mann	„	460	0 3 0·00	69 0 0	100 ft.
	E. Draper	Reed's Gully...........	800	0 3 0·00	120 0 0	40 to 80 ft.
	Malander	Bushman's Lead, Opossum, Sardine, & Grt. Northern.	6,240	0 5 0·00	1,560 0 0	„
	Tyers.........................	Tearaway Lead.........	500	0 4 0·00	100 0 0	20 to 40 ft.
		Frenchman's...........	400	0 3 0.00	60 0 0	7 to 12.
		Welcome	1,000	0 0 12·00	25 0 0	
	M'Intyre	Bushman's	2,500	0 4 0·00	500 0 0	
		Opossum	1,000	0 5 0·00	250 0 0	
		Sardine	1,500	0 4 0·00	300 0 0	80 ft.
		Welcome	600	0 5 0·00	150 0 0	
	O'Donnell....................	M'Guigan's	800	0 4 0·00	160 0 0	40 to 110 ft
	Armstrong & Co.	„	434	0 3 0·00	65 2 0	
	Perser & Co..................	„	366	0 4 0·00	73 4 0	
	Shanks & Co.	„	725	0 3 0·00	108 15 0	
	Various Mines	Wapping Butcher ...	288	0 5 0·00	72 0 0	
	Do.	Tichbourne	250	0 4 0·00	50 0 0	
	Do.	Great Northern, Ben Nevis, & London.	2,600	0 3 0·00	390 0 0	70 to 90 ft.
	Solway	Gibson's Lead	700	0 3 0.00	105 0 0	15 to 20 ft.
	Ferguson	North Lead	200	0 5 0·00	50 0 0	30 ft.
	Stevens & Co.	London	2,000	0 5 0·00	500 0 0	80 ft.
	Perry & Co.	„	400	0 3 12·00	70 0 0	100 ft.
	Various Mines	„	1,100	0 3 0·00	165 0 0	60 ft.
	Bray	Richardson's...........	1,000	0 4 0·00	200 0 0	100 ft.
		Welcome	1,500	0 5 0·00	375 0 0	35 ft.
	Various Mines	Frenchman's, Paddy's Flat,&Nibbler'sCreek	1,900	0 3 0·00	285 0 0	5 to 90 ft.
		Nibbler's Creek	300	0 5 0·00	75 0 0	10 to 14.
		Welcome	40	0 6 0·00	12 0 0	
			33,078	0 3 21·62	6,452 1 0	

YIELD of Gold from Wash-dirt—*continued.*

District and Division.	Name of Company.	Locality.	Quantity.	Average yield of Gold per ton.	Total yield of Gold.	Depth of Workings.
SOUTHERN DISTRICT—			tons.	ozs. dwts. grs.	ozs. dwts. grs.	
Araluen Division	Crown Sluicing Co.	Araluen	123,659	0 0 3·00	772 17 11	30 ft.
Major's Creek Division	Various Mines	Long Flat	700	0 0 12·00	17 10 0	1 to 25 ft.
		"	800	0 1 0·00	40 0 0	
		"	700	0 2 0·00	70 0 0	
		"	400	0 2 0·00	40 0 0	
		"	150	0 5 0·00	37 10 0	
		"	500	0 4 0·00	100 0 0	
		"	1,300	0 0 12·00	32 10 0	
		"	500	0 1 0·00	25 0 0	
		"	600	0 1 0·00	30 0 0	
		"	1,000	0 1 0·00	50 0 0	
		Jembaicumbene	2,000	0 1 0·00	100 0 0	
Little River Division	Wisbey & Co.	Mosquito Flat, Little River.	5,000	0 0 6·00	62 10 0	8 ft.
	Gifford & Co.	Sergeant's Point	2,400	0 1 0·00	120 0 0	6 "
	Dunshea & Co................	Docter's Hill, Little River.	3,600	0 0 12·00	90 0 0	8 "
			143,309	0 0 5·31	1,587 17 11	

Summary.

QUANTITY of Gold obtained from certain parcels of Wash-dirt, puddled, sluiced, &c., during the year 1877, showing the average yield of Gold per ton.

District.	Quartz crushed.	Average yield of Gold per ton.	Total yield of Gold.		
	tons.	ozs. dwts. grs.	ozs.	dwts.	grs.
Bathurst District	21,625	0 2 7·58	2,504	0	0
Tambaroora and Turon District	1,674	0 3 13·44	297	19	16
Mudgee District..	1,160	0 3 0·00	174	0	0
Lachlan District..	33,078	0 3 21·62	6,452	1	0
Southern District	143,309	0 0 5·31	1,587	17	11
	200,846	0 1 2·32	11,015	18	3

THE following information has been obtained by the Wardens and Mining Registrars respecting certain parcels of Quartz crushed during the year 1877.

District and Division.	Name of Company.	Locality.	Quartz crushed.	Average yield of Gold per ton.			Total yield of Gold.			Depth at which Quartz was obtained.
			tons.	ozs.	dwts.	grs.	ozs.	dwts.	grs.	
BATHURST DISTRICT— Mitchell's Creek Division	Curnow & Party	Mitchell's Creek	60	0	10	0·00	30	0	0	40 ft.
	Robertson & Morgan	Sunny Corner	120	1	0	0·00	120	0	0	50 „
	M. J. Morgan	„	1,050	2	0	0·00	2,100	0	0	70 „
	F. Robertson	Mitchell's Creek	100	0	15	0·00	75	0	0	100 „
			1,330	1	14	23·09	2,325	0	0	
TAMBAROORA AND TURON DISTRICT— Hill End Division	Brown's	Hawkins' Hill	231	2	5	0·00	519	15	0	90 to 150 ft.
	Patriarch	„	39	0	19	0·00	37	1	0	260 ft.
	Paxton's	„	236	0	11	0·00	129	16	0	150 to 200 ft.
	Monte Christo	„	146	6	0	0·00	876	0	0	140 to 175 „
	Beyers & Holtermann's	„	151	5	0	0·00	755	0	0	120 to 175 „
	Khroman's	„	77	1	15	0·00	134	15	0	130 to 175 „
	Frenchman's	„	299	1	13	0·00	493	7	0	200 to 250 „
	Carroll & Beard's	„	36	7	0	0·00	252	0	0	120 to 175 „
	Hicks	„	46	3	0	0·00	138	0	0	200 ft.
	Cornish	„	52	2	0	0·00	104	0	0	250 „
	Hermann's	„	665	4	0	0·00	2,660	0	0	200 to 220 ft.
	Cock & Party	„	75	2	10	0·00	187	10	0	150 ft.
	Cornelian	Prince Alfred Hill	87	0	11	0·00	47	17	0	220 „
	Rosevear	„	35	2	10	0·00	87	10	0	100 „
	Gillard & Jeffree	„	9	0	6	0·00	2	14	0	80 „
	Star of Peace	Hawkins' Hill	58	0	10	0·00	29	0	0	130 „
	Excelsior	Hill End	112	1	5	0·00	140	0	0	100 „
	Sheargold & Party	Golden Gully	6	2	0	0·00	12	0	0	100 „
	Dragon	Hill End	411	1	5	0·00	513	15	0	120 „
	Wade & Party	Tambaroora Road	247	0	14	0·00	172	18	0	120 „
	Henshaw & Party	„	41	0	14	0·00	28	14	0	120 „
	Marshall Bros.	„	55	0	11	0·00	30	5	0	80 „
	Miller & Party	Red Hill	41	0	14	0·00	28	14	0	150 „
	King & Party	Golden Gully	39	0	14	0·00	27	6	0	150 „
	Goddard & Party	„	39	0	10	0·00	19	10	0	140 „
Ironbarks Division	Gilbert & Co.	Near Stony Creek	21	2	9	1·14	51	10	0	30 „
	Jones & M'Manus	„	30	0	7	8·00	11	0	0	20 „
	J. Fitzsimons & Co.	„	13	2	3	0·00	27	19	0	23 „
	Corlett & Freestone	Beehive Reef	60	0	10	0·00	30	0	0	50 „
	Do.	Near Prince William	10¼	1	4	0·00	12	12	0	25 ft.
	Marshall	Stockyard Creek	28	0	8	0·00	11	4	0	Surface.
	Tout & Wells	Bonsworth's Reef	60	0	9	0·00	27	0	0	30 ft.
	T. Fitzsimons	Near Beehive Reef	16	0	15	0·00	12	0	0	Surface.
	Freestone & Co.	Splitters' Gully	42	0	10	0·00	21	0	0	„

YIELD of Gold from Quartz—*continued.*

District and Division.	Name of Company.	Locality.	Quartz crushed.	Average yield of Gold per ton.			Total yield of Gold.			Depth at which Quartz was obtained.
			tons.	ozs.	dwts.	grs.	ozs.	dwts.	grs.	
TAMBAROORA AND TURON DISTRICT—*continued.* Ironbarks Division—*continued.*	Nickelsen& Fitzsimons	Stringybark	217	0	17	10·06	189	0	0	150 ft.
	Various Mines	Monk's Reef............	393	0	16	11·35	323	14	0	
		Great Britain	80	0	15	0·00	60	0	0	
		Poor Man's...	121	0	15	0·00	90	15	0	
		Post Office	153	0	8	12·54	65	4	0	
		Trickett's	173	2	4	14·98	386	0	0	
		Splitters' Gully	254	0	18	3·59	230	10	0	
		Poor Man's Reef	282	0	9	15·48	136	0	0	
		Perseverance Reef ...	12	3	14	0·00	44	8	0	
		Ginger Reef	340	0	2	0·00	34	0	0	
		Great Britain Reef ...	522	0	11	15·40	303	17	0	
		Post Office Reef	220	0	7	0·00	77	0	0	
		Trickett's Reef	80	0	12	0·60	48	2	0	
		Monk's Reef............	45	0	11	20·80	26	14	0	
		The Chump Reef......	160	0	2	12 00	20	0	0	
		Canadian	28	0	8	8·57	11	14	0	
Sofala Division	Do.	Surface Hill	65	1	10	15·87	99	13	0	
		Whalan's Hill	56	0	7	16·42	21	10	8	
			6,714½	1	9	4·62	9,800	13	8	
MUDGEE DISTRICT. Welligton Division	Mitchell's Creek Co....	Mitchell's Creek	4,428	0	10	0·00	2,214	0	0	245 feet.
	Kaiser	Do.	1,160	0	3	0·00	174	0	0	65 „
			5,588	0	8	13·12	2,388	0	0	
LACHLAN DISTRICT—	Foster's Reef G.M.Co.	Lake Cudgellico	2,872	0	5	0·31	719	18	0	140 feet.
Forbes Division	Various Mines	Forbes	500	0	3	7·87	83	4	0	
Grenfell Division	Consols G. M. Co. ...	O'Brien's Hill	893	0	13	13·36	605	6	11	500 „
	Pettit & Co.	Enterprise Reef	140	1	6	0·00	182	0	0	200 „
Parkes Division	Extram & Party	Bonnie Dundee	115	0	16	0·00	92	0	0	170 feet.
	Do.	Do.	88	0	11	0·00	48	8	0	200 „
	Ralph & Party.........	Do.	52	0	9	0·00	23	8	0	160 „
	Do.	Do.	46	0	12	0·00	27	12	0	70 „
		Dayspring................	176	0	6	0·00	52	16	0	80 „
	Hazelhurst	Buchanan...............	6	1	9	0·00	8	14	0	
		Victoria..................	14	0	2	0·00	1	8	0	40 „
		Old Bushman's	6	1	0	0·00	6	0	0	120 „
	Various Mines	....	20	0	7	0·00	7	0	0	20 „
	Wright & Others......	....	20½	0	2	11·25	2	10	0	
	Hazelhurst	....	13	1	7	16·61	18	0	0	

YIELD of Gold from Quartz—*continued.*

District and Divison.	Name of Company.	Locality.	Quartz crushed.	Average yield of Gold per ton.			Total yield of Gold.			Depth at which Quartz was obtained.
			tons.	ozs.	dwts.	grs.	ozs.	dwts.	grs.	
LACHLAN DISTRICT—*contd* Parkes Division—*contd.*	Evanwitch	Richardson's Lead	19	1	17	12·63	35	13	0	
	Dickinson	Strickland's	23	1	1	17·73	25	0	0	
	Jones	Welshman's	52	6	5	0·00	325	0	0	
	J. Davies	Currajong	80	0	6	0·00	24	0	0	80 to 200 ft.
	Johnson & Party		130	0	15	0·00	97	10	0	
	Pattenson & Party	Bushman's	100	0	18	0·00	90	0	0	200 ft.
	Various Claims	Mitchell's, Bonnie Dundee, & Opossum Reefs	2,000	0	10	0·00	1,000	0	0	90 to 125 ft.
			7,365¼	0	9	10·49	3,475	7	11	
SOUTHERN DISTRICT— Araluen Division	Various Mines	Bell Creek	381	0	13	7·02	253	4	12	Surface to 50 ft.
Major's Creek Division	Do.	Red Hill	115	1	0	16·86	119	0	20	
		,,	19	0	6	13.26	6	4	12	
		,,	18	1	10	00·00	27	0	0	
		,,	6	0	10	12·00	3	3	0	
		,,	55	1	10	0·00	82	10	0	
		,,	16	0	18	18·00	15	0	0	
		,,	26	1	1	0·00	27	6	0	
		Major's Creek	9	0	16	0·00	7	4	0	
			645	0	16	18·33	540	12	20	
TUMUT AND ADELONG DISTRICT— Adelong Division	Various Mines	Adelong	411	0	18	9·45	378	0	0	690 ft.
	Do.	,,	1,624	0	12	20·67	1,044	7	0	Various levels.
	Extended Victoria	,,	198	0	13	5·57	131	0	0	295 ft.
	Victoria Research	,,	123	1	13	10·53	205	13	0	400 ,,
	Trudgeon & Party	,,	20	1	10	0·00	30	0	0	200 ,,
	Annetts & Co.	,,	1,038	2	7	23·90	2,491	0	0	680 ,,
Gundagai Division	Pike & Champion	Jones's Creek	10	2	0	0·00	20	0	0	30 ft.
	A. H. Meurant & Co.	Junee	100	2	17	0·00	285	0	0	70 ,,
Tumbarumba ,,	Peep-o'-Day Tribute Co	Ournie	232	2	6	13·75	540	5	0	110 ,,
	Do.	Do.	210	0	2	23·42	31	5	0	110 ,, (mullock)
	Isabella Machine Co.	Do.	556	1	4	0·90	668	5	0	120 ,,
	Pilot Reef Co.	New Meragle	1,122	0	11	2·39	622	14	0	120 ,,
Yarrara ,,	Perseverance	Yarrara	416½	0	11	16·91	243	15	0	200 ,,
			6,060½	1	2	1·95	6,691	4	0	

Yield of Gold from Quartz—*continued.*

District and Division.	Name of Company.	Locality.	Quartz crushed.	Average yield of Gold per ton.			Total yield of Gold.			Depth at which Quartz was obtained.
			tons.	ozs.	dwts.	grs.	ozs.	dwts.	grs.	
Peel and Uralla District—										
Armidale Division	Golden Star	Glen Morrison	50	14	6	9·60	716	0	0	130 ft.
	A. Gallagher & Co. ...	Cameron's Creek	18	1	13	13·33	27	10	0	80 „
Barraba „	J. T. Fletcher & Co....	Reading's Reef.........	145	0	15	20·68	115	0	0	130 „
Scone „	Fuller's Reef Co.......	....	124	1	0	3·87	125	0	0	220 „
			337	2	18	8·86	983	10	0	
New England and Clarence District—										
Dalmorton Division.........	Clarence Pioneer G. M. Co.	Perseverance Reef ...	120	0	0	17·43	4	8	0	Surface to 40 ft.
	Tributer's Prospecting Claim.	Do.	28	0	3	6·00	4	11	0	50 ft.
	Scottish Chief	Scottish Chief Reef...	2	1	0	0·00	2	0	0	
	Homeward Bound ...	Homeward Bound ...	44	0	7	6·54	16	0	0	30 „
Lunatic „	Scott, Thompson, & Co.	Drake.....................	20	3	5	0·00	65	0	0	50 „
			214	0	8	14·24	91	19	0	

Summary.

Quantity of Gold obtained from certain parcels of Quartz, crushed during the year 1877, showing the average yield of Gold per ton.

District.	Quartz crushed.			Average yield of Gold per ton.			Total yield of Gold.		
	tons	cwt.	qrs.	ozs.	dwts.	grs.	ozs.	dwts.	grs.
Bathurst District	1,330	0	0	1	14	23·09	2,325	0	0
Tambaroora and Turon District	6,714	10	0	1	9	4·62	9,800	13	8
Mudgee District	5,588	0	0	0	8	13·12	2,388	0	0
Lachlan District	7,365	5	0	0	9	10·49	3,475	7	11
Southern District	645	0	0	0	16	18·33	540	12	20
Tumut and Adelong District	6,060	10	0	1	2	1·95	6,691	4	0
Peel and Uralla District	337	0	0	2	18	8·86	983	10	0
New England and Clarence District	214	0	0	0	8	14·24	91	19	0
	28,254	5	0	0	18	14·73	26,296	6	15

TABLE showing the width, dip, and strike of Quartz Reefs in some of the deepest Mines in the Colony being worked during the Year 1877, and the average yield of Gold per ton.

District.	Division.	Name of Company.	Name of Reef.	Depth at which Quartz was got.	Quantity crushed.	Average yield of Gold per ton.			Width of Reef.	Dip of the Reef. (from the horizon.)		Strike of the Reef (Bearing.)
				ft.	tons.	ozs.	dwts.	grs.		Direction horizontal	Degrees.	
Bathurst	Carcoar	Brown's Creek	Flint Lode	90	19,571	0	1	12·22	90 ft.	N.	......	N.W.
	Mitchell's Ck.	Curnow & Co.	(Mitchell's Creek)	40	60	0	10	0·00	15 in.	......	9° 28′	E. & W.
		Robertson and Morgan	(Sunny Corner)	50	120	1	0	0·00	2 ft.	Flat reef	......	N. & S.
		M. J. Morgan	do.	70	1,080	2	0	0·00	3 to 13 ft.	......	11° 19′	"
		F. Robertson	(Mitchell's Creek)	100	100	0	15	0·00	1 ft. 6 in.	Flat reef	......	E. & W.
Tambaroora and Turon	Hill End	Brown's	Brown's	90, 100, 150	231	2	5	0·00	....	......	......	N. & S.
		Patriarch	Patriarch	260	39	0	19	0·00	....	......	......	"
		Paxton's	Paxton's	150, 200	236	0	11	0·00	....	......	......	....
		Monte Christo	Monte Christo	145, 175, 140	146	6	0	0·00	....	......	......	....
		Beyer's and Holtermann	Beyer's and Co.	120, 175	151	5	0	0·00	....	......	......	....
		Khroman's	Khroman's	130, 175	77	1	15	0·00	....	......	......	....
		Frenchman's	Frenchman's	200, 250	299	1	13	0·00	....	......	......	....
		Carroll and Beard	Carroll and Beard	175, 120	36	7	0	0·00	....	......	......	....
		Hick's	Hick's	200	46	3	0	0·00	....	......	......	....
		Cornish	....	250	52	2	0	0·00	....	......	......	....
		Hermann's	Hermann's	200, 220	665	4	0	0·00	....	......	......	....
		Cock & Co.	Cock, Attwood, and Dwyer's	150	75	2	10	0·00	....	......	......	....
		Cornelian	Hawkin's Hill	220	87	0	11	0·00	....	......	......	....
		Roseveàr	Prince Alfred Hill	100	85	2	10	0·00	....	......	......	....
		Gellard and Jeffree	do.	80	9	6	0	0·00	....	......	......	....
		Star of Peace	Hawkin's Hill	130	58	0	10	0·00	....	......	......	....
		Excelsior	Hill End	100	112	1	5	0·00	....	......	......	....
		Sheargold & Co.	Golden Gully	100	6	2	0	0·00	....	......	......	....
		Dragon	Hill End	120	411	1	5	0·00	....	......	......	....
		Wade & Co.	....	120	247	0	14	0·00	....	......	......	....
		Henshaw & Co.	....	120	41	0	14	0·00	....	......	......	....
		Marshall Bros.	....	80	55	0	11	0·00	....	......	......	....
		Miller & Co.	....	150	41	0	14	0·00	....	......	......	....
Mudgee	Wellington	Mitchell's Creek	Mitchell's Creek	245	4,428	0	10	0·00	2 ft.	W.	......	N.
Lachlan	Forbes	Foster's Reef G. M. Co.	Cudgellico	140	2,872	0	5	0·31	1 ft. 6 in.	N.	45°	N. 10° E.
Tumut and Adelong	Adelong	North Caledonian	Williamstown Flat	150	....	....			....	perpendicular		W. & S.
		Trudgen & Co.	Caledonian Reef	200	20	1	10	0·00	6 in.	W.	......	....
		Victoria Research	Victoria Reef	400	123	....			6 in.	E.	......	N.
		Flagstaff	do.	812	....	....			4 ft.	E.	......	S. 11½ E.
		Extended Victoria	Donkey Hill	295	198	....			1 ft.	E.	18° 26′	....
		Challenger	Adelong	430	....	....			6 in.	W.	......	....
		Williams	Victoria Reef	660	1,624	....			9 in.	E.	......	N.
	Gundagai	Pyke and Champion	Pyke & Champion's Reef	30	10	2	0	0·00	1 ft. to 3 ft.	W.	2° 52′	N. & S.
		A H. Meurant & Co.	Junee	70	100	2	17	0·00	4 ft.	......	......	"
	Tumbarumba	Peep o' Day	Ournie	110	232	....			6 in. to 2 ft.	W.	4° 46′	N.
		Isabella Machine Co.	do.	120	556	....			1 ft. 6 in.	E.	9° 28′	N.E.
		Pilot Reef Co.	New Meragle	120	1,122	....			6 in. to 2 ft.	W.	8° 8′	S 6° W.
	Yarrara	Perseverance	Yarrara	200	416	....			4 in. to 3 ft. 6 in.	......	4° 17′	E. & W.
Peel & Uralla	Armidale	Kitcher, Stretton, & Co.	Golden Star	130	50	....			9 in.	W.	18° 26′	N. 2° W.
		Alexander Gallagher & Co.	Homeward Bound	80	18	....			1 ft.	......	5° 43′	N.
	Barraba	J. Fletcher & Co.	Reading's Reef	130	145	....			3 ft.	S.	......	N. & S.
New England and Clarence	Dalmorton	Tributers' Prospecting Claim	Perseverance Reef	50	28	0	3	6·00	2 ft.	S.	30°	E. & W.
		Homeward Bound Co.	Homeward Bound	30	44	0	7	6·00	1 ft. 6 in.	S.	......	"
	Lunatic	J Shoobert & Co.	Lunatic Reef	154	50	....			2 ft.	W.	5° 43′	N. & S.
		Scott, Thompson, & Co.	do.	50	20	....			6 in.	......	9° 28′	"

TABLE showing approximately the Machinery employed in Gold and Tin Mining during the Year 1877.

District and Division.	Quartz.								Alluvial.													
	Steam Engines employed in Winding, Crushing, &c.		Crushing Machines.	Stamp-heads.	Whims and Pulleys.	Water-wheels.	Derricks.	Whips.	Steam Engines employed in Winding, Pumping, &c.		Puddling Machines.	Whims and Pulleys.	Whips.	Quicksilver as compound cradles.	Sluices and Toms.	Water-wheels.	Hydraulic Hoses.	Pumps.	Sluice Boxes.	Derricks.	Stamp-heads.	Boring Machines.
	No.	Aggregate horse power.							No.	Aggregate horse power.												
BATHURST DISTRICT—																						
Bathurst	3	40	3	35	5	...	...	...	...	...	4	6	...	...	...	...	...	...	...	...	...	...
Trunkey	4	140	5	79	2	1	...	2	...	...	2	...	...	...	...	...	...	...	...	...	...	...
Tuena	3	49	3	35	...	...	...	...	...	...	...	...	...	...	20	3	...	3	24	...	...	...
Carcoar	8	91	8	117	1	...	...	...	...	...	3	4	...	...	8	...	...	...	...	...	...	...
Cowra	...	...	...	...	...	...	...	...	...	...	...	2	...	...	1	...	...	...	...	...	...	...
Oberon	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rockley	1	5	1	5	...	...	...	...	...	...	1	...	...	...	12	...	...	2	12	...	...	...
Orange	4	100	4	28	2	...	...	...	1	40	...	...	...	...	...	...	...	1	...	...	...	...
Mitchell's Creek	3	32	3	13	1	...	...	...	...	...	...	...	...	...	15	...	...	...	4	...	...	...
TAMBAROORA AND TURON DISTRICT—																						
Hill End	20	392	15	184	5	1	2	5	...	...	1	...	...	50	40	2	...	...	20	...	...	...
Sofala	6	93	6	50	3	...	...	...	...	...	8	...	...	...	...	17	...	17	...	...	...	...
Ironbarks	4	45	4	47	...	...	...	1	...	...	7	...	...	...	8	1	...	...	...	...	...	...
MUDGEE DISTRICT—																						
Gulgong	2	...	2	25	...	...	...	...	...	...	5	1	5	...	...	...	...	...	54	...	...	...
Mudgee	1	16	2	12	...	1	...	...	...	...	6	4	10	...	10	2	...	2	10	...	...	...
Wellington	3	...	2	35	1	...	...	...	...	...	...	...	...	...	3	3	...	3	50	...	...	...
Hargraves	2	18	3	17	...	1	...	...	...	...	22	...	...	...	...	...	...	...	...	...	...	...
Rylstone	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
LACHLAN DISTRICT—																						
Forbes	3	47	2	22	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...
Parkes	5	85	5	70	5	...	...	...	...	...	22	90	...	...	...	...	...	22	...	...	...	...
M'Guigan's	1	12	...	...	...	...	...	...	...	...	17	50	...	...	...	12	...	12	...	...	...	...
Cargo	2	25	2	21	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Grenfell	4	57	3	...	3	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...
Young	3	32	3	28	...	...	...	...	...	...	3	1	1	...	...	...	...	...	...	1	...	...
SOUTHERN DISTRICT—																						
Braidwood	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	5	...	40	50	...	...	...
Araluen	2	20	3	28	...	1	...	...	3	63	...	...	2	...	...	10	4	20	44	...	...	...
Major's Creek	4	32	3	42	...	...	...	...	...	...	12	3	1	...	...	3	...	...	...	...	...	...
Little River	...	...	...	...	...	...	...	...	1	...	...	...	...	...	60	12	...	2	150	...	10	...
Nerrigundah	1	4	1	4	...	...	...	...	...	...	...	...	...	...	12	4	...	4	12	...	...	...
Shoalhaven	...	...	3	11	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE showing Machinery, &c.—*continued.*

District and Division.	Quartz.								Alluvial.													
	Steam Engines employed in Winding, Crushing, &c.		Crushing Machines.	Stamp-heads.	Whims and Pulleys.	Water-wheels.	Derricks.	Whips.	Steam Engines employed in Winding, Pumping, &c.		Puddling Machines.	Whims and Pulleys.	Whips.	Quicksilver and compound cradles.	Sluices and Toms.	Water-wheels.	Hydraulic Hoses.	Pumps.	Sluice Boxes.	Derricks.	Stamp-heads.	Boring Machines.
	No.	Aggregate horse power.							No.	Aggregate horse power.												
SOUTHERN DISTRICT—*continued.*																						
Moruya	1	20	1	10	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gundaroo	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...
Gunning	2	24	2	18	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TUMUT AND ADELONG DISTRICT—																						
Adelong	3	...	2	31	14	2	...	4	1	30	...	...	3	...	...	6	...	5	5	...	...	...
Reedy Flat	...	...	1	4	...	...	...	...	...	...	...	...	...	...	12	...	4	...	12	...	...	...
Tumut	1	10	1	8	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gundagai	...	...	3	30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Yass	1	12	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tumbarumba	4	40	4	31	2	...	...	...	...	...	...	...	...	...	120	10	10	...	600	...	...	...
Kiandra	1	40	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Yarrara	3	76	6	28	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Albury	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	1	...	...	...	...
Queanbeyan	...	...	1	5	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
PEEL AND URALLA DISTRICT—																						
Armidale	1	8	1	8	...	...	...	2	...	...	...	...	...	...	...	...	2	...	...	...	...	...
Uralla	...	...	...	...	...	...	...	...	...	...	...	2	4	...	2	...	1	2	12	...	...	...
Nundle	1	15	5	26	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scone	2	20	3	26	1	1	...	....	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Bingera	1	15	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Barraba	1	10	1	...	...	...	...	...	...	...	2	1	...	...	...	...	...	1	2	...	...	...
Tingha	...	...	1	5	...	...	...	...	6	45	...	1	...	...	...	1	...	60	60	...	...	1
Vegetable Creek	...	...	...	...	...	...	...	...	1	12	30	7	...	...	...	...	...	36	39	...	...	1
Walcha	1	8	1	15	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Barrington (Back Creek)	1	14	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
NEW ENGLAND AND CLARENCE DISTRICT—																						
Tenterfield	2	20	2	14	7	4	...	7	2	...	2	4	2	...	...	3	...	15	...	...	...	...
Little River	1	30	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Solferino	2	25	4	35	1	2	...	3	...	...	...	...	...	...	...	...	...	...	12	...	...	...
Ballina	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...
Lunatic	2	13	4	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

The foregoing tables have been compiled from information supplied by the Wardens and Mining Registrars.

Department of Mines,
Sydney, 15th April, 1877.

HARRIE WOOD.

WARDENS' REPORTS.

BATHURST DISTRICT—BATHURST, OBERON, ROCKLEY, TRUNKEY, AND TUENA DIVISIONS.

(*Mr. Warden T. A. Smith, Trunkey.*)

Trunkey.—I am pleased to be able to state, that notwithstanding the year being one of drought, and consequently of scarcity of water for sluicing purposes, an increase of alluvial gold has been obtained in this division, but in the other divisions a decrease has been experienced; the quantity of gold obtained at Trunkey was 1,603 ozs., being 1,167 ozs. alluvial and 436 ozs. quartz gold. One mill has crushed occasionally for tributors—in all about 515 yards of quartz crushed.

Tuena.—Very limited mining operations have been carried on in this division. The Chinese have fossicked the old workings and creeks. A few Europeans have worked a little about Junction Point, both at alluvial and quartz mining, but a reliable return of the gold obtained cannot be got, but am informed that it will not probably reach beyond 650 ozs.

Peelwood Copper Mine, which is in this division, has been kept steadily working during the year raising ores, and smelting, but the result of the operation is not obtainable.

Rockley.—This division has suffered greatly for want of water, but little mining is carried on—only 231 ozs. alluvial gold has been obtained. The copper mines have not prospered as I anticipated.

Oberon—Is a deserted gold-field, but I believe payable copper will be found in this division.

Bathurst.—In this division, for the want of water, mining has been very limited, fossicking in the creeks and near waterholes is the only way alluvial gold has been obtained, but with a return of wet seasons there will be a great increase in the return of alluvial gold. The copper mines have all been steadily at work, and I hope with satisfactory results. The only thing new in mining is the opening of an Iron Mine near the Back Creek Railway Station. I am informed a large quantity of the ore has been sent to the works at Lithgow.

The divisions of the gold-fields under my charge have, with the exception of Tuena, all been examined during the year by the Government Geologist, and I believe that officer's report will be decidely opposed to selling the land in Trunkey, Tuena, and Rockley divisions. Gold can be obtained in any of these localities, but not in large quantities. Miners, more especially Chinese, can during wet seasons obtain good livings by working for gold, in almost every creek and gully that flows into the Abercrombie River, and I believe rich leads will yet be discovered under the basalt ranges so frequently to be met with in these parts of the Western Gold Fields.

BATHURST DISTRICT—ORANGE DIVISION.

(*Mr. Warden Lane, Orange.*)

GOLD mining operations in my division of the Bathurst District are certainly not very active, nor have they been for some time past. Different reasons are assigned; some think "the gold is worked out," others say that "capital and skilled labour" are all that is required. My opinion inclines to the latter. If Ophir had been properly and systematically worked, instead of "rooted over," the results would have been very different. Several Hill End miners have said, if the money and labour had been spent at Ophir that has been at Hill End, the effects would decidedly be in favour of the former. The very rich "leads" and "finds" at Ophir did not come from the sky. There must be one great "source" and "union" somewhere. Many are of opinion that Lucknow is the former; as to the exact whereabouts of the latter, no one is in a position to say.

Two Mile, Back Creek, Carr's Creek, and Mullion are almost abandoned. At the Mullion very expensive machinery was erected by Mr. Holterman some time ago, but upon what authority I have been unable to ascertain. Operations are at a stand-still.

At a recent crushing at the Forest Reefs, about 750 ounces of gold were obtained.

There is good stone now being raised at Lucknow.

During the past year, Sub-inspector Garvin has received and forwarded to Sydney by escort 14,012 ozs. 2 dwts. 8 grs. from Orange, and no doubt parcels have been sent through other channels.

BATHURST DISTRICT—CARCOAR DIVISION.

(*Mr. Warden North, Carcoar.*)

SINCE I had the honor of forwarding to you my report for 1876, of the mining operations carried on in my division of the Bathurst District, I regret to say that the same cause which so seriously retarded gold mining pursuits during that period has been felt with even greater severity during the past year. I allude to the want of sufficient rain to fill the dams and make the water-courses run, in consequence of which sluicing operations have been entirely stopped, and quartz crushing almost at a stand still.

The Brown's Creek Gold Mining Company, although only fully at work for some four or five months, produced about 1,500 ounces of gold in 1877, as against 2,500 ounces in 1876. The prospects of this mine are encouraging, and when the drought breaks up a large increase in the yield is anticipated.

At Gally Swamp, the only claim worked is that of the prospectors (Lane and party), who have had two or three successful crushings, the yield being said to have averaged 2 ounces to the ton, the stone being taken from small veins or leaders.

The alluvial claims at Woods Flat are worked by from thirty to forty miners, and several claims have considerable quantities of stuff ready for washing (when rain comes), which will no doubt repay the patience of those who have been engaged in obtaining it.

The Junction Claims, which I stated in my last report had changed owners, and were again about to be worked, have lain idle ever since. It was intended by the new proprietors to work their crushing machinery by water-power, but the unprecedentedly dry seasons have rendered their plans impracticable for the present.

The Prince of Wales Claim, at Burnt Yards, which had yielded the richest stone in my division, has ceased work. Owing to the inexperience and want of energy of the shareholders, the principal part of whom were working miners, the claim latterly has not paid expenses. It has now changed owners, and if a strong company were formed who would carry on the works with energy and system, I believe fortunes are yet to be made out of it.

The holders of alluvial claims at Lumpy Swamp and The Forest, as well as those engaged in sluicing operations at Flyer's Creek, seem contented with their earnings, having, notwithstanding the scarcity of water, obtained a fair amount of the precious metal.

On the whole, I should say, the quantity of gold obtained during the past year is fully equal to the produce of 1876,—the escort returns from Carcoar showing 3,043 ounces forwarded in 1877, as against 3,548 ounces in 1876; but a large portion of the gold raised at Lumpy Swamp and The Forest has been disposed of at Orange, and consequently does not appear in these returns.

Copper.

THE Milburn Creek and Coombing Mines have continued during the year to turn out considerable quantities of ore, and the percentage of copper obtained from them has, I believe, been highly satisfactory to the proprietors.

TAMBAROORA AND TURON DISTRICT.

(*Mr. Warden Sharpe, Hill End.*)

I HAVE the honor to submit my report for the past year on the Tambaroora and Turon Mining District.

2. In this report I do not think it necessary to describe fully each locality that has been the scene of mining operations in time past, inasmuch as these localities have already been fully described in my previous reports, and that now their number is considerably reduced in consequence of the depression in mining generally that has existed since the end of the year 1873. This depression I do not attribute to the failure in finding gold, but on the contrary the failure

in prosecuting the search has been the cause of the non-discovery of gold; that is to say, if prospectors had continued steadfast in their pursuit, and capital had been forthcoming as it was needed, instead of this gold-field being in the depressed state it is I believe it would now have counted many payable mines. In proof of this, the almost simultaneous closing of the majority of the mines may be mentioned as showing that the work ceased from the want of funds, and not from the want of successful results. Undoubtedly money was expended in many places where there was no chance of a return, but it is equally certain that a very great number of mines held forth, and still hold forth, most reasonable prospects of payable returns. I could mention many instances in this district where large sums of money were expended, and the work stopped at a point utterly useless as a test of the intrinsic value of the mine, and where slightly extended operations would have probably decided the question as to its value or worthlessness. Shafts and tunnels can be seen—or rather the ruins of them—in this district in many places, which never even reached the vein they were started to prospect, and in very few instances was anything more done than the mere piercing of the vein by the shaft or tunnel driving and sinking on the reef, the true test of its value, has been in most instances altogether neglected.

3. I shall now proceed to describe the mines at work in this district. In the Hill End division of it the number is about fifty. At Chambers Creek, where so many companies were floated, and such sanguine anticipations indulged in, there are now but one or two claims at work; one of these I am informed is on payable stone. From Chambers Creek to the Lower Turon, an area that includes many large and gold-bearing reefs, the whole line is idle except one lease of 2 acres, the property of Messrs. Brüns, Stultz, and party, who are working a vein supposed to be a continuation of Marshall's Line, or Marshall's Rich Vein. This lease was formerly known as the Thistle, and that company drove a tunnel along the vein some 80 feet, and then, I am informed, abandoned the mine. It was then taken up by the present party, who have sunk a shaft in the tunnel 50 feet, from which a crushing of a few tons was lately taken which paid expenses. Messrs. Stultz and party expect that the next crushing will be better, and appear to be satisfied with the prospects of their mine. Coming north, and crossing the Turon River, we reach the South Star Line of Reef, on which four mines are at work —Jeffrey and party, Goddard and party, the South Star Company, and Hall and party. The first on the line coming north is a small lease worked by Jeffrey and party—tributors. A shaft has been sunk about 120 feet, and stone taken from it which yielded 3½ ounces to the ton. The tributors are working in the shaft at the 80-foot level, driving to cut the shoot of gold Goddard and party in the adjoining mine are working on. The South Star Line of Reef is, I believe, the only one of the western veins that has proved payable. The next claim is Goddard and party—five men's ground. This party have sunk two shafts on the vein—one 110 feet, the other about 100 feet. They have had two crushings from the reef—one of 5 tons, which gave 5 ounces to the ton; and one of 11 tons, which gave 3½ ounces per ton. The work at present engaged in is raising stone for another crushing, which is expected to yield 3 ounces per ton. The next mine is a 7-acre lease called the South Star, the property of Mr. Alfred Fairfax, but at the present time let on tribute. The tributors are working at two different levels—60 and 90 feet. The stone carries gold, but not in payable quantities.

Next north, and about 300 yards from the northern boundary of the South Star, is a block claim belonging to Messrs. Hall and party, who have not been long at work, but I believe have obtained good specimens from the vein, which encourages them to continue sinking. The South Star Line has been opened up about ¼ of a mile; many shafts have been sunk on it, the deepest of which is 270 feet. The vein is from 3 to 6 inches wide, and has yielded as much as 7 ounces to the ton. Crossing Oakey Creek, and on Hawkins Hill proper, are four claims at work, on Eisenstadter's Line of Reef. The first is known as the Lord and Lady Belmore, but I am unable to give any information about the mine, and the proprietors have only just started to work. Next, the New Lady Belmore, a 3-acre lease, and worked by a party of eight. This mine has been at work for more than twelve months. Before the present company took the mine in hand it was worked by a public company, who sunk a shaft 180 feet on the vein. In sinking this shaft, at a depth of 70 feet, they took crushings which yielded as much as 7 ounces to the ton. They then drove a tunnel in on the vein at the south end of the lease, and expended a considerable amount of money. Having expended their capital the lease was abandoned, and after the expiry of two years was taken up by the present company, who at once took out a small crushing of 22 tons, which yielded a little over 3 ounces to the ton. They then sank a new shaft, 100 feet south of the old company's shaft, and got payable stone at a depth of 30 feet, and from that depth to the present—75 feet—rich specimens have been obtained. A crushing of 19 tons from this mine, treated last week, gave the proprietors the handsome return of 207 ounces 3 dwts. I may mention that a portion of this parcel of stone, estimated to contain over 26 ounces of gold, was kept back, and the specimens forwarded to Sydney—if these specimens had been crushed—the average yield would have been much larger. The vein in the New Lady Belmore lease averages 5 inches in width, and the ground is not difficult to work.

Next the New Lady Belmore is the lease known as the Royal Standard. This mine was formerly worked by a company, who sunk a shaft 120 feet on the vein and took out several crushings, not payable. They then, their operations being hindered by too much water, drove a tunnel in from the gully below, and by this means effectually drained the mine. Further work was done, and stone raised, which did not yield payable returns, and the mine was let on tribute. The tributors have been at work for a period of eighteen months, and have got out various crushings, which, in the aggregate, have proved payable. The last crushing, lately treated, gave 3 ounces to the ton.

Next adjoining on the north is the Golconda, a 2-acre lease originally in the hands of a company, who drove a tunnel in from Oakey Creek a long distance to cut the vein, and after sinking some 10 feet on it and driving 15 or 20 feet discontinued work. The present holders, Messrs. Collings and party, have risen from the tunnel 70 feet and sunk 60 feet without finding payable stone. Gold was found along the bottom of the old company's drive, which it has now been decided to follow, that being probably the same shoot of gold as is being worked in the Royal Standard and New Lady Belmore mines.

Going further north, and on the main line of the Hawkins Hill reefs, is the lease known as Tallentire and Beard's, which is let to a tribute party, who have been working on the Rose of England vein at a depth of about 150 feet. These tributors are at the present time engaged on King's vein, ond are raising stone supposed to be payable.

Next is the lease known as Gellard and Jeffrey's, also let on tribute. The tributors have until lately been working on the Rose of England vein, at a depth of 140 feet, from which they took a crushing of 16 tons, yielding the handsome return of 7 ounces to the ton. This stone, however, was only a block left in the old workings. This party are now engaged in prospecting what are known as the Patchy Veins. The leases between Gellard and Jeffrey's and Rapp's, viz., the Rose of England, Johnson's, the Guiding Star, the Bang Bang, and the Great Western Undaunted, have been recently amalgamated as the Victoria Gold Mining Company, and preparations, I am informed, are now being made to start work.

In Rapp's lease, which has been worked on tribute for the last twelve months by Messrs. Anderson and Hammond, the search for the expected continuation of Krohmann's and Carroll and Beard's gold has been unsuccessful. Only one vein in this mine has as yet been found to carry payable gold, and that was in the flat ground, was worked by the Messieurs Rapp, and is possibly the missing link.

Carroll and Beard's and Krohmann's leases come next. I speak of these conjointly, inasmuch as they have been united to carry on prospecting operations. The workings in the upper part of the mine have been simply raking out the remains of the old veins and cleaning up the old stulls, and as such have no great public interest. The operations in the bottom of the mine are of great interest, although as yet unsuccessful. The holders have reached a depth of 730 feet on the main belt of veins, which brings them nearly to their eastern boundary, and are now driving a cross-cut west at the bottom of their perpendicular shaft, at the 500-feet level, but so far without discovering a payable vein. This work, together with that in the Star of Peace mine, may be considered the most important in the district, as being the only operations now going on to develope at a depth the Hawkins Hill mines, and is being watched with great interest by all interested in the future of the hill.

In Beyers and Holtermann's, the next mine on the north, besides some unimportant work, a prospecting cross-cut is being put in to the west, but as yet without satisfactory results. Next is the Monte Christo Company's ground, which company has completed its gleaning operations, and has now decided on continuing the westerly cross-cut at the 260 feet level, to reach Brown's New Vein, as it was called when first discovered some years ago in Brown's claim. This vein has been but little prospected, although of a very promising character both as to the quartz itself and the enclosing slate.

Rawsthorne's lease and Brown's are let on tribute, but the operations in these mines are of no importance to the general public, as no prospecting is being carried on.

Next is Cock, Attwood, and Dwyer's lease. This company are working a vein in the footwall of the westerly workings, which may be called a new vein, as it has not as yet been worked anywhere, except in the adjoining claim, Brown's. In Hickson, Creighton, and Beard's I am informed that the crushing now being treated is probably the last that can be obtained from the mine. The Rampant Lion has been idle for some time past, and is worked out.

Next is Paxton's lease. A fresh run of gold has been discovered in this mine on the vein known as Paxton's, and the prospects are payable as far as is known. The present depth on these veins is 320 feet, at which depth a level has been driven joining the north and south shafts, and underhand stoping from the south shaft northwards is being carried on. The manager is sinking on the vein known as Stephen's, eastward of the main run of the Hawkins Hill veins. The stone looks promising, but the depth attained is not sufficient to catch the shoot of gold known to run in from the Star of Peace. Next is the Star of Peace mine. This company now holds all the ground east of the rich claims, as far south as the Great Western Undaunted, embracing an area of 10 or 11 acres. The work of this mine during the past twelve months has been mainly confined to the Star of Peace vein, the main shaft on this having been sunk to a depth of 760 feet. The sinking has shown a constant variety of changes, in the form of new veins, blows, &c.—veins appearing and disappearing, veins breaking up into leaders, and on several occasions gold has been struck which was thought to be payable, but on trial the results have been so far unsatisfactory. The water is heavy in the mine at the bottom of the deep shaft. Of late, I may here mention that dynamite has been used almost entirely in the shaft and stopes with great economy, giving general satisfaction. Some few months back a shoot of gold was struck in sinking the shaft, and great expectations were entertained that this was a discovery of great value; but a few feet sinking showed that the gold did not extend to any depth. At the 630 feet level a drive is being put in towards the north in the hope of picking up a new shoot of gold from Fischer and Beard's blow. Operations have also been resumed in the backs, on the western vein, the only representative of the very rich veins in Krohmann's, Beyers and Holterman's, and other claims further south. At the 240-feet level, I am glad to be able to report that payable stone has been struck, and the manager expects to get enough money from this vein to carry on the deep workings without drawing on the capital of the company. Preparations are being made to test the foot-wall of Paxton's veins, as also Holman's in the shallow ground from the old south shaft. This company is working the lease known as the Crown Prince, on tribute, which is separated from the Star of Peace lease only by Fischer and Beard's and Hermann's. The operations in the Crown Prince are confined to working on two blows; one in the northern part of the lease, known as Mathewson's blow—up against which, and for a short distance south, the vein (the Star of Peace) shows very good gold. The other blow, on the south boundary, known as Hermann's, or Fischer and Beard's, has just run into the Crown Prince lease from Hermann's. Where it crossed the boundary the stone appeared very good; but nothing has been seen in it since, although it has been sunk upon for some distance. The present Crown Prince United comprises the leases formerly known as Matthewson's, Oxon's, the Crown Prince, the Speculation, and the Morning Star.

Next is Fischer and Beard's. This company's operations have been for the last twelve months mainly confined to the Star of Peace vein, and that known as the Western vein, which have supplied a series of remarkably good crushings, but are now worked up to the eastern boundary, where they enter Hermann's mine. Work has also been done on Paxton's veins, whence I am informed payable stone has been obtained. This company's prospecting consists in driving a cross-cut to the west—which work has however been stopped as nothing payable was found—and in driving on the Star of Peace vein, north of the blow, in the hope of finding payable stone in that direction, but the gold does not appear to extend north of the blow in payable quantities.

West, and adjoining Fischer and Beard's, is Hermann's lease, which is let on tribute. The tributors have sunk a shaft 360 feet against time, to reach a shoot of gold on the Star of

Peace vein traced up to the boundary; and great praise is due for the courage displayed in attempting so costly a work, as the failure to complete it within the stipulated time would have been followed by the forfeiture of the tribute and loss ot all the outlay. The tributors were rewarded by several remarkably good crushings, but now have passed through the shoot and can find nothing payable. This valuable deposit, just mentioned, existed in connection with the large blow on the Star of Peace vein, known as Fischer and Beard's blow, and is identical with that now being worked on the south boundary of the Crown Prince.

The lease formerly known as the Monitor, eastward of Hermann's and Meyer's, and now called the Anticipated Eye-opener, has been at work continuously for a considerable period, and a shaft has been sunk to a depth of 145 feet, with 60 feet of driving on the vein, known as Rowley's Rich Vein. The proprietors are of opinion that they will cut the two first foot-wall veins in a few more feet, when, if the same rule holds good which prevails in the line of veins immediately below, they have every reason to believe that they will be well rewarded for their trouble and expense. This completes the leases at work on Hawkins Hill proper, with a well-defined cross-course separating it from Prince Alfred Hill. It is impossible to say what effect this cross-course has on the veins to the north, whether it has heaved them out of their position or not. South of it the veins have a bearing east of north, north of it they all run west of north. The gold, so far as the work hitherto done has shown, is found in a vein supposed to be the Frenchman's vein, but asserted by many to be the Star of Peace vein, although these veins are 250 feet apart on Hawkins Hill. I now come to the Patriarch lease, which joins the Crown Prince. In the Patriarch a straight shaft has been sunk 380 feet, and cross-cuts driven east and west, of which the latter showed a number of promising veins, but none of them payable. In the former, the Frenchman's vein, lately cut at a depth of 360 feet, shows payable stone. This company have driven up to their north boundary, and are driving to the south preparatory to back-stoping on the Frenchman's vein.

The Cornish is the next lease at work, of which the proprietors are a party of working miners, who are driving and stoping southwards, their shaft having attained a depth of 320 feet —this may be considered a payable mine. Next is the lease known as the Frenchman's, and let on tribute. The only vein worked here is that from which the lease takes its name, and which has hitherto paid good wages, that is to say for the last twelve months.

The Cornelian is next, which is also let on tribute, and the tributors are working the Frenchman's vein. A great deal of work has been done in this mine, but hitherto without payable results; the vein is large but not payable.

The next lease at work is called the Sons of Freedom. This party are engaged on a small vein considerably eastward of the Frenchman's, and supposed to be Rowley's vein—it is not payable.

Next is the Royal Saxon. The upper portion of a shoot has been worked in this lease with good results; but the vein has been lost, and preparations are now being made to try and pick it up again by sinking a new shaft

The Lombard Street mine is next. This company deserves great credit for the energy, perseverance, and patience they have displayed in working their mine. I am informed that they have been engaged in prospecting the Excelsior vein but without success, and are now sinking between the walls of a vein that has run out, in the hope that it will make again. Their present depth is 270 feet.

Next is the Excelsior. The proprietors of this mine, having followed the Excelsior vein as far as possible, have left those workings and sunk two shafts on a vein eastward of that known as the Excelsior. I am sorry to say that a crushing from the new vein, just finished, is not payable.

The next lease at work is that called the Prince of Wales, and is let on tribute. A vein showing very nice gold was found in this ground and is now being worked with payable results. The success of this mine has set several claims on the same line in search of the same vein.

The Dragon Company's lease is next, let on tribute. The tributors are back-stoping on the Dragon vein with payable results; the same may be said of the Dragon No. 2, who are working a vein 12 feet to the west of the Prince of Wales vein.

Next is the Venus, which company have been prospecting several veins, finding patches of gold in most of them, but not sufficient to meet the expenditure. A party of tributors, Messrs. Dieckman & Company, are working a vein on the northern boundary of the Venus, known to be good, but I have been unable to get particulars of the actual yield from it.

Some distance north of Dieckman's party is a lease called the Perseverance, the property of Messrs. Tetcher and party. In this lease there are two veins that have been worked to a considerable depth. One called Tetcher's vein has been prospected for a distance in length of 200 feet, and shafts have been sunk on it from 140 feet to 160 feet in depth. This vein is only about 2½ inches in width, but has yielded an average of about 3½ ounces to the ton, giving the owners from £3 10s to £4 per week per man. The other vein I have mentioned is east of Tetcher's vein, averages 5 inches in width, and has yielded an average of not less than 2 ounces to the ton. The Perseverance was formerly the property of a company, and bore the name of the United Reefers. This company sank a shaft 235 feet deep, and drove a cross-cut in 190 feet, cutting both the veins I have mentioned as being worked by the Perseverance company. The work done by the United Reefers Gold Mining Company must have cost at least £2,000. Messrs. Tetcher and party have been continuously working their mine for the last three years.

I now come to what may be called the Tambaroora reefs. Of these I am sorry to have to report that there are but few at work. The first I shall describe is that known as the Magnet. This line of reef has been prospected for a distance of about a ¼ of a mile, and shafts have been sunk on it to the depth of 110 and 120 feet. The reef varies in thickness from 2 to 4 feet; but of this body of stone only from 9 inches to a foot has been proved payable. The only mine at work on this line is the Magnet, which is an extended claim of three men's ground, the property of Messrs. Wade and party, who have been at work for the last two years, and during that period have taken out and crushed from their mine 960 tons of stone, yielding an average of ½ an ounce to the ton, which gives them rather over £2 10s per week per man. The sinking on this line of reef is not expensive, no powder being required. Strange to say little or no work has been done on this line, except in the claim I have just mentioned. A few holes have been sunk, but that is all. About 150 yards east of the Magnet is another line of reef, called the Canton, which has been worked by various parties for some years past. The reef has been prospected for about one quarter of a mile, and nine or ten shafts sunk on it varying in depth from 120 to 130 feet. In several of these payable stone was obtained; but the water was found to be too strong for manual labour. The Canton reef, or vein, varies in thickness from 3 inches to a foot; and from it a large quantity of quartz has been raised and crushed by various parties, with payable results. The ground is easily worked, and a yield of 15 pennyweights per ton would give the ordinary rate of wages. The highest yield obtained from the Canton reef was, I am informed, 3 ounces to the ton. At the present time Messrs. Marshall Brothers are the only party at work on this line, and their last crushing, from a depth of 70 feet, of 50 tons, gave current wages.

I now come to the Red Hill, Tambaroora. I have not been able to ascertain how many veins, from which payable stone has been obtained, have been discovered and worked at various times on this hill; but they cannot be less than twelve in number. I know of no locality in this district where more promising prospects of success are held out to gold miners than the Red Hill at Tambaroora; and it is much to be regretted that these reefs are allowed to lie idle. The only mines at present at work are as follows:—Messrs. Pyemont and party, tributors, working a vein called the Old Red Hill vein, which averages in width about 6 inches, has been prospected for a distance of about 150 yards, and has yielded as high as 5 ounces to the ton. Messrs. Pyemont and party are at present engaged in prospecting at the 70 feet level, and consider their prospects good, although not at present on payable stone.

The next claim at work on the Red Hill belongs to a party of Chinese, who have raised a considerable quantity of stone which they consider payable. Further north are Messrs. Kissell and party. In this claim it is almost impossible to describe the veins, which are very numerous and close together. As soon as one payable patch is worked out, another is sought for and obtained. Messrs. Kissell and party have been at work in their claim continuously for the last two years, and their last crushing of 80 tons gave them the current rate of wages, viz., £2 10s. per week per man.

Next to Messrs. Kissell and party's claim is that known as the Perseverance, the property of Messrs. Demos and party, who are not at present, I am informed, on payable stone. Still further north a party of miners are working in a claim formerly known as the Gigantic Struggle. The principal vein in this mine is from 6 inches to a foot wide, and has been worked to a depth of 190 feet, yielding very good stone—some of it giving 5 ounces per ton, and some as high as 10 ounces. At 140 feet the water-level was reached, and at 190 feet it became too strong for manual labour.

When this occurred the stone appeared payable; and the proprietors tried to raise capital, by forming a company, to work the mine, but failed. At the present time the proprietors are engaged on a vein which they consider payable, but they have not as yet had a trial crushing.

Beyond the Red Hill there is another party at work on the Valentine line of reef—Messrs. Fisher and party. This reef has been prospected for a considerable distance, and the quartz in some places has been very rich, yielding as much as 33 ounces to the ton. The deepest shaft on the line is not more than 120 feet. A small crushing of 8 tons was lately taken from this reef by Messrs. Fisher and party, and yielded 14 ozs. 12 dwts. 13 grs. The vein is about 6 inches wide, in soft rock.

I have now given such information as I have been able to obtain about all the mines at work in the neighbourhood of Hill End and Tambaroora.

The alluvial digging in and about Tambaroora and Hill End has been long since exhausted; but there are still a few fossickers who make a precarious living by working in the creeks and gullies ground that has been turned over perhaps a dozen times.

At the Pyramul, except a little alluvial, there is no mining being carried on. I may here mention to show how carelessly mining was carried on when the diggings first broke out, that about the end of May last a miner named Foster found about a foot beneath the surface, at a place called Croke's Gully, close to the Pyramul township, a nugget weighing 26 ozs. 7 dwts. This gully has been worked over and over again, and yet this large nugget escaped notice.

At the Crudine, on what is called Johnson's Reef, one party are at work, who, I am informed, have just taken a crushing from the shaft sunk by the prospector, which yielded something like 4 ozs. to the ton. This line of reef seems not to have had a fair trial.

At Pulley's Hill or Ulmarrah, one of a series of basalt hills extending for many miles down the Macquarie on both sides of the river, I regret to have to report that mining operations have ceased. The two private companies who leased this hill, or most of it, after going to great expense in making roads to transport machinery, and after erecting such machinery at Pulley's Hill, have not been able to make the cement and drift pay.

It is generally thought by miners of experience that the quantity of gold in these cement hills will not pay, where crushing batteries are used to extract the gold, which is not equally distributed through the wash; it occurs in patches, and only actual trial will tell how far a patch extends.

At the Horse Bald Hill, which is a few miles down the river from Pulley's, there are about a dozen miners working in four different parties. Here the wash-dirt varies in thickness, from 12 inches to 6 feet, and the average yield per ton is 3 dwts. At Finch's Bald Hill, which is situated about 3 miles up the river from the hill last mentioned, there are about six miners at work (Italians). The yield of gold here has been a little better than on the others. Besides the basalt hills I have mentioned, there are others lower down the Macquarie on which small parties of miners are working, who are making wages at the rate of about £2 per week per man.

On all these cement hills the want of water keeps the miner from permanent work. From about April to the latter end of September is the only time of the year, save in wet seasons, that permanent water is to be obtained. The only kind of appliance at present used by the miners for saving the gold is the ordinary sluice supplied by storm water. If an hydraulic sluice could be got to bear on these cement hills, as they are called, no doubt the returns would be enormous.

The next mining locality I shall mention is the Box Ridge. Here the principal lines of reefs are the Britannia, the Shakespeare, the Homeward Bound, Hans', and the Nobby. On the Britannia, about seven years ago, a very rich surface-patch was found, which yielded upwards of £40,000 worth of gold. Some eight or nine shafts, varying in depth from 25 to 75 feet, were sunk, but nothing payable was got. This reef runs in the side of the hill quite flat for about 20 yards, and then dips about 1 in 2. It varies in width from 1 foot to 5 feet. The Shakespeare line has had more work done on it than any of the others. The reef is vertical, and varies in width from about 1 foot to 4, with occasional large blows. It has been traced for nearly 400 yards, but the whole of this distance has not been prospected. About half-a-dozen shafts have been sunk to depths varying from 40 to 100 feet. This reef has yielded as much as 3 ozs. to the ton, but the general run of stone has not given more than half-an-ounce. A tunnel was driven about 150 feet on to this reef, and at this level the 3-oz. stone I have mentioned was obtained. No work has been done on this line for the last six months. Curry's is a flat reef, varying from 18 inches to 2 feet in width, and has been prospected for about 100 yards. Four shafts have been sunk on it, the deepest of which is not more than 70 feet. The yield has been from 4 dwts. to 3 ozs. to the ton. Between 300 and 400 tons of quartz have been crushed from this reef.

The Homeward Bound line of reef has been prospected for about 150 yards. The reef is a vertical one, and varies in thickness from 6 inches to 18 in width. Seven shafts have been sunk on the line, the deepest of which is 90 feet. The great drawback to the working of this reef is the water which is struck at a depth of 40 feet, and cannot be overcome without the aid of machinery. The same may be said of the Shakespeare line of reef before mentioned, but there the water is not troublesome till a depth of about 100 feet is reached. The Homeward Bound Reef has yielded from 11 dwts. to 3½ ozs. to the ton. I am informed that about 1,000 tons of stone have been raised and crushed from this reef.

Hans' line of reef is a recent discovery, and at the present time is the only one at work on the Box Ridge. The prospector's shaft, Messrs. Gaffney and party, is down about 70 feet on the reef, which varies in width from 3 to 12 inches. A trial crushing of 18 tons gave rather more than 3 ozs. to the ton. Two leases of 5 acres each have been taken up on this line, and one block claim—the prospector's—four men's ground. Hans' Reef is rubbly but well defined; the hanging-wall is sandstone, the foot-wall soft slate. Messrs. Gaffney and party found gold beside the sandstone wall, and followed it down to a depth of 40 feet, when the vein commenced to make. A peculiar feature in this reef is the abundance of mica which is mixed in the veinstone where the vein is rubbly. The mica occurs in veins, sometimes running alongside the quartz, and sometimes in lumps which being broken up contain free gold. If there is no mica there appears to be no gold, at any rate in payable quantities. The mica is pale yellow and brown in colour, and when rubbed between the hands goes to powder like the ordinary mica, but unlike the ordinary mica this is greasy and coats the hands like paint.

The Nobby Reef is a vertical one, with a very slight underlay, and varies in width from 6 inches to 2 or 3 feet. Two shafts have been sunk on it to a depth of about 50 feet; the reef has been traced on the surface for about half a mile, but has been prospected only for about 100 yards; the yield per ton has been from half an ounce to 1 oz. per ton; the vein is well defined, and the country easy to work. It is generally supposed that this reef has not received the attention it deserves. One line of reef at the Box Ridge I have omitted to mention, called Monk's. This has been traced for about 50 yards, is 10 or 12 inches wide, and has an underlay of about 1 in 3; three shafts have been sunk on it, the deepest of which is 70 feet; the yield has been from 7 dwts. to 1½ oz. No work has been done on this line for the last two years. The Box Ridge Reefs have been traced for a distance of about 1½ mile in length, and their bearing is nearly north and south. The known lines run parallel to one another within a belt composed of sandstone and slate of about 100 yards in width. Between these lines of known veins or reefs there are numerous other veins cropping ont on the surface, but which have not been prospected. The country is known to miners as fair working country, and the expense of sinking does not I am informed exceed 25s. per foot. The great drawback in working the Box Ridge Reef is the water, which requires machinery to overcome it. In the Homeward Bound line of reef, the water is reached at a depth of 40 feet; in another, the Shakespeare, at 70 feet. From what I can learn, in every instance where shafts have been sunk on these reefs below the water-level, the gold still continues in the reef, and the deepest shaft is not more than 100 feet. The few miners still left at this place (there are, all told, not more than fourteen, alluvial and quartz) are all poor, and the want of capital prevents the reefs from being prospected. In conclusion, I may state that there is a good crushing mill with ten head of stampers erected close to the reefs.

At the Quartz Ridge mining matters show signs of improvement; and it is to be hoped, if the prospects of success at present held out continue, the place will regain its former prestige. At the Quartz Ridge there is one main line of reef that has been worked. This is well defined as far as is known—that is to a depth of about 120 feet. The reef is wide, averaging fully 2 feet; in places it is 6 feet in width. This line has been traced upwards of 3 miles, and in some places proved rich, but patchy; this fault would probably be amended if greater depth was attained. During the mining mania of 1872, the whole line of reef from the Quartz Ridge to Deepdale, a distance of over 4 miles, was leased, and on some of these leases a considerable amount of work was done; shafts were sunk and tunnels driven, but, either from want of funds or patience, the mines were abandoned; and I believe I am correct in stating that most of these leases are now cancelled. At present the only mine at work at the Quartz Ridge is that known by the name of the Just in Time—of which the proprietors are Messrs. Hall and party, who are working a vein, east of the main line, 18 inches wide, with an easterly underlay well defined, easy to work, and up to the present time has yielded 92 ounces for 92 tons. If this yield continues, and I believe that there is every prospect that it will, the proprietors will clear £3 per week per man, exclusive of expenses. Doubtless, if this mine continues to pay, other parties will give the Quartz Ridge a trial, and I have little doubt but that they will be satisfied with the results. I may add that in the immediate vicinity of the reefs there is a crushing machine sufficiently powerful to supply the wants of a considerable mining population.

In the Sofala Division of this district mining is at a very low ebb. The quartz reefs are almost all abandoned, there being at the present time not more than half a dozen claims and leases at work. The manager of Moyle's Surface Hill Gold Mining Company, at Wattle Flat, reports:—"That work has been steadily carried on during the past year; the tunnel driven to the north has been extended to a distance of 416 feet, and the vein in the face of it has a promising appearance. On Brady's vein, a considerable amount of ground has been stoped and worked to a depth of about 60 feet. 65 tons of quartz raised yielded 99 ozs. 4 dwts. 17 grs.; but owing to the hardness of the rock and small size of the vein, it has not been deemed advisable to work deeper at present. Small crushings have been taken from other veins in the lease, which showed good gold in patches; but, owing to the narrowness, they would not pay under the present system of working. As regards this mine, practical miners agree in the opinion that, if the hard rock found in sinking could be got through, a complete change in the character of the veins would take place, and in all probability magnificent returns obtained."

At Whalan's Hill, near Sofala, I am informed that some payable stone was obtained during the past year by the proprietors of the only mine at work there, Messrs. Vial and party, but that the mine is not now payable, and that it is intended to make fresh arrangements forworking it.

I have not been able to obtain any information concerning the "Circus Point Hydraulic Sluicing Company," but presume the dry weather we have had during the past year has been a bar to their progress. I am informed that it is intended to start the reef at Spring Creek, near Sofala, to work with as little delay as possible. The necessary machinery has been purchased, and as these reefs bear a very high character, the probabilities are that the proprietors will not have cause to complain of their investment. At Ironbarks, Stoney Creek, and Muckerawa, which embrace a large area, there are 26 quartz reefs known. All of these have been worked at various times, but not to any depth. I am informed that no shaft has been sunk on any of them much deeper than 100 feet, and that in most cases the quartz has not been found payable over 60 feet. At that depth, with one or two exceptions, barren stone is met with, which has never been sunk through. The surface quartz, to the depth above mentioned, has been in many instances rich. During the mining mania, a great deal of capital was recklessly expended in the Ironbarks District, but only in useless work and on the surface. The reefs now appear to be gradually attracting attention, and it is to be hoped that they will now receive a fair trial. One reef at Ironbarks called Trickett's, I may mention, which is yielding at the present time very handsome returns. It was discovered in May last by a miner named Numa Chaddeyson, is 3 feet wide, and from a considerable quantity of stone has yielded an average of 2 ozs. 15 dwts. to the ton. On this reef there are at the present time working two leases and two claims. The depth attained is but 40 feet, and it has been prospected for a distance of 100 yards. There are two crushing-machines at Ironbarks, one at Muckerawa, and one at Stoney Creek.

Alluvial mining in this division is at present in a languishing condition; but there are numerous gullies and flats about the Macquarie and other localities near Ironbarks, Stoney Creek, and the Muckerawa, where wash-dirt is to be found of from 2 to 30 feet deep that would pay handsomely if water could be brought to bear on it. There is no mining being carried on in the Tambaroora and Turon Mining District for minerals other than gold, except at a place called Razorback on the Upper Turon, where, as I have stated in my Report for last year, a reef containing antimony has been discovered, and is now being worked by Messrs. Julius Wannick and party, who have sunk a shaft on it 80 feet. The antimony was struck at about 10 feet from the surface, and worked from that depth to 30 feet. 20 tons of the ore obtained was sent to Sydney, but did not pay expenses. From 70 feet to the present level the vein is much better defined, and is from 14 to 16 inches wide; it is also of good quality, yielding about 1 in 4 of antimony. This reef contains gold in small quantities, but this the proprietors have not been able to save. 10 tons of antimony lately sent to Sydney by Messrs. Wannick and party, from their mine, has yielded a satisfactory return.

The alluvial workings in the Tambaroora and Turon mining district, as in all the older gold-fields, are almost exhausted, although there are still scattered along the Turon and Macquarie Rivers and their various tributaries, parties of Chinese, who obtain considerable quantities of gold by re-working old ground, and Europeans who, by keeping cattle-farming at one season of the year, and mining at another, when water is plentiful enough to allow of puddling and sluicing, manage to make a comfortable livelihood.

In conclusion, there is little to be said concerning Hawkins Hill, the most important part of my district, except what I have already stated in my last report. The past twelve months has been occupied in most of the mines on Hawkins Hill, in taking out blocks of ground left behind by the companies as worthless, running stulls, &c., a kind of mining which can only be termed "fossicking." In some instances this work has paid the tributors well, in others barely expenses. The upper levels are now nearly all removed, and nothing remains but deep sinking or cross-cutting to the west. The deepest mine on Hawkins Hill is that belonging to the Star of Peace company, which has reached a depth on the Star of Peace vein of 750 feet. At this level, the reef is fully 8 inches wide, and occasionally shows gold but not in payable quantities. There is a probability, however, that payable stone will be struck before a much greater depth is attained. This Company now occupy a large area on the Hawkins Hill—they hold the leases known as the Guiding Star and Rose of England south of Rapps', and also all the eastern country from Rapps' on the south to the Star of Peace proper on the north. There are on Hawkins Hill at the present time perhaps one or two of the early claims that would for a time pay a company of working miners; but in most cases where depth has been attained, and the surface stone removed, it would be useless to attempt to work these mines without powerful machinery and a large command of capital. During the past year, in this division of my district thirty-six gold-mining leases have been applied for, of which many are cancelled leases, and of these many more would be re-occupied were it not for the difficulty (except perhaps for a surveyor) in identifying any particular lease. Most of the land on the main line of reef has been or is under lease, and in the majority of cases there are no boundary marks to be found, and this probably is one of the causes why so few complaints are lodged concerning the non-fulfilment of the labour conditions of gold-mining leases. I do not see how this difficulty can be overcome, unles a re-survey is made, and with proper connections, which I am informed are wanting in most of the leases in this district. I may mention that several cases have come under my notice where miners have gone to work on land that they believed to be open to occupation, and which had been lying idle for years, discovered payable stone, and then the lessee, who had really abandoned the lease, has stepped in, and either driven the men out who had proved the value of his lease for him, or else they have had to submit to his terms.

Before concluding this report, I may mention that a common cause of complaint among the miners is, that they do not always reap the benefit where they have lodged complaints against lessees for the non-fulfilment of the labour conditions of their leases, because in most instances the lessees are residents in Sydney, and have the earliest information when a lease is cancelled, and that this gives them an advantage over the working miner, whose time is almost entirely taken up by his occupation. I believe many more of these complaints would be lodged if the complainants having proved their case were allowed a prior right to the lease when it was cancelled.

In the present state of things, it is impossible to give a decided opinion on mining in this district, but I have no doubt that if capital could be obtained there are numerous reefs that would pay handsomely if properly worked. It seems, however, that the development of these reefs must depend on the energy and perseverance of the working miners themselves, and I do not think that these qualities are wanting in our mining population. At Hill End and Ironbarks I am able to state that there are a considerable number of mines, in most instances cancelled leases formerly the property of companies, where the present holders, working miners, are doing well, that is to say, they are raising payable stone and earning good wages, and in one or two instances the mines are rich—for example, the New Lady Belmore and Trickett's Reef. There is a remedy which would probably revive the mining industry in the Colony, but it is attended with danger and difficulty—danger, that the money advanced as capital would not be properly expended; and difficulty in obtaining proper men to carry out the project. I am aware that prospecting parties in the sister Colony, Victoria, have not been successful, except perhaps in one or two instances, but there the prospectors were sent to find gold-fields—here the gold-fields are already found. In many parts of this district, and in other parts of the Colony, there are reefs known to contain gold, and from which payable crushings have been obtained, but as soon as wages were not to be made, the working miner was compelled to give his claim up and seek another surface-patch, although he was fully convinced that if he had capital to continue sinking and prospecting his reef would turn out a payable one. If a sufficient sum of money could be supplied by the Government, to be used for the purpose of testing such reefs, and care taken that it was properly expended, I believe in a short time mining would become a recognized investment for capital.

The annexed schedule shows, as nearly as can be ascertained, the quantities of gold won in this district during the year 1877, from which it appears that in the Hill End Division there is an increase of 957 ozs. 4 dwts. 20 grs. over the returns for that division in 1876. In the Sofala Division there is a decrease of 1,726 ozs. 8 dwts. 21 grs., and at Ironbarks of 2,883 ozs. 14 dwts. 2 grs.; but in these two last-mentioned divisions it is very difficult, if not impossible, to get a correct estimate of the gold won during the year, as a great deal of it is sent to Sydney by other ways than by escort.

RETURN showing the quantity of Gold won in the Tambaroora and Turon Mining District, during the year 1877.

Division.	Quarter ending.		ozs.	dwt.	grs.	
Hill End	31 Mar., 1877	Quartz and Alluvial	5,418	8	18	By Escort.
	30 June, 1877	,,	6,453	12	6	,,
	30 Sept., 1877	,,	4,357	13	10	,,
	31 Dec., 1877	,,	4,203	7	20	,,
		Total	20,433	2	6	
Sofala	31 Mar., 1877	Quartz and Alluvial	1,016	4	23	,,
	30 June, 1877	,,	1,331	10	17	,,
	30 Sept., 1877	,,	1,263	6	8	,,
	31 Dec., 1877	,,	1,384	10	20	,,
			4,995	12	20	
		By post	331	6	0	
		Total	5,326	18	20	
Ironbarks	31 Mar., 1877	Quartz and Alluvial	333	1	0	,,
	30 June, 1877	,,	546	6	0	,,
	30 Sept., 1877	,,	969	6	0	,,
	31 Dec., 1877	,,	880	0	0	,,
			2,728	13	0	
		In hands of storekeepers	177	11	3	
		Forwarded to Sydney privately	680	10	0	
		Total	3,586	14	3	
		SUMMARY—				
		Hill End	20,433	2	6	
		Sofala	5,326	18	20	
		Ironbarks	3,586	14	3	
		Grand total	29,346	15	5	

Value at £3 17s. 6d. per ounce, £113,718 14s. 8¾d.

During the past year no separate returns have been kept of Alluvial and Quartz Gold, I am therefore obliged to give the total.

MUDGEE DISTRICT.

(*Mr. Warden Browne, P.M., Gulgong.*)

IN furnishing my Annual Report upon the state and prospects of the Mudgee Mining District, I regret to be compelled, as at this season of the preceding year, to refer to the exceptional dryness of the spring and summer. This climatic condition, though by no means so disastrous to mining operations as to those of the farmer and grazier, has yet a distinctly injurious effect upon mining industry generally.

In the absence of the ordinary rainfall, enterprise is checked and restricted, while expenses are augmented. Notably, in all co-operative mining work where a large steady supply of water is indispensable delay if not stoppage of full work must take place.

The humbler classes of miners, who in all gold-fields comprise a noticeable element of the population, are especially affected by this abnormal state of matters. They are apt to lead somewhat wandering lives, carrying their appliances with them, and settling down for weeks or months together upon partly abandoned workings, as fortune may prove propitious. Without capital sufficient to support themselves upon the large gold-fields, these miners are peculiarly dependent upon seasons favourable for travelling and easy testing of localities. In many respects, being chiefly men of wide experience, they may be considered to be a valuable section of the mining community; their earnings in the aggregate amount to considerable value, and as they prospect over extensive areas they frequently discover rich mineral or alluvial deposits.

During such a season as the last year has unhappily rendered memorable, such wayfaring and such gold-seeking are well-nigh rendered impossible. Hence, large number of the roving diggers have taken service with or contracts from squatters, and will only return to their old haunts when the water-courses are once more filled, and the face of the earth fertilised with the rains of heaven.

Hydraulic mining, though usually conducted in this district in the immediate vicinity of rivers or permanent water-courses, has languished through the lowering of the waters of even considerable streams.

At the junction of Cudgegong with the Euingela Creek, where the rival parties of Harrington and Spencer (the former known as the Mudgee River Sluicing Company) have erected expensive dams and tail-races involving unusual labour and outlay, no work is now carried on.

The supply of water, once sufficient to enable the shareholders to undermine and sluice large areas of alluvial at the minimum of cost, has for the last two years been vainly expected. The property is retained in charge of a shareholder on either side; and if the next ensuing autumn prove propitious, no doubt operations will be resumed.

I may mention that I have myself seen very fair samples of gold taken from the sluice-boxes of these claims, and am of opinion that in ordinary seasons they would return satisfactory dividends.

In the neighbourhood of Wellington, at the junction of a creek running down from the flank of a bold range known as the Black Mountain, I visited a large Chinese party who have for some years past been employed in sluicing portions of the river bank, of which a large area had been stripped. The river being at the time of my visit lower than almost during the memory of man, they had abandoned that plan of operation and were working shafts in the bed of the river. I had no opportunity of testing the value of their gains, as the Chinese are invariably reticent on such subjects, and do not always sell to the local Bank. But from the well-to-do appearance of the association, and the amount of work done, I should judge the returns to be satisfactory.

There were no European miners in the neighbourhood apparently, but at no great distance above their camp, on the river-flat traces were visible of a large area of alluvial having been worked, from which, without doubt, gold in considerable quantities had been obtained, by the appearance of the shafts.

Excessive flow of water in the deeper alluvial drifts is often a bar to success, as in the case of a lease, the Star of the West, originally worked by a large associated party about three years since, which has been again occupied. It is situated at the intersection of the Moonlight and Adams Lead, a short distance to the south-west of Gulgong, in Crown Land which has always been sanguinely viewed as likely to resuscitate the glories of Gulgong. The shaft is nearly 200 feet in depth, and is slabbed except where the rock renders such precaution needless. With the aid of a steam-engine the water was so far conquered as to permit the opening out of a drive, when several ounces of gold were discovered before any great amount of work was done. It is, however, not at present in my power to give further satisfactory details of the adventure, as owing to a split among the shareholders, such as too often happens in otherwise promising mining speculations, it is probable that work will cease for the present, to the great disappointment of the many adjoining claim-holders, who had looked upon the Star of the West as a guiding beacon.

Leases have been taken up of the adjoining ground, and also of the Red Lead and the lower part of the Black Lead. A steam-engine will be available for the pumping of this latter lease. It seems possible that the true course of the Black Lead, in ground deeper than any as yet worked, may be found to the north-west of the present workings; if such be the case, and capital be applied to its development, another line of red flags may yet be seen in that once famous locality.

I had hoped in this report to have been able to furnish favourable statistics of the progress and yield of the quartz reefs in the Mudgee District, and more particularly in the neighbourhood of Gulgong. Such, however, has not been possible; the Welcome Reef, at Three Mile, from which much was expected, has diminished perhaps temporarily in productiveness. Work is still going on for the purpose of testing the reef at greater depth; but in the absence of profits the area under lease has been contracted, and fewer men are of necessity employed.

The most profitable and apparently most permanent quartz reef in the district is situated on Mitchell's Creek, in the vicinity of Wellington. This well-defined reef, known as the Mitchell's Creek Mine, has been worked now for many years past, formerly by the Mitchell's Creek Company, but now by two gentlemen of capital residing in Sydney. It has largely contributed to swell the amount of gold sent away by the escort from Wellington, which this year reached the total of 3,127 ozs. This mine is worked by tributors, who pay to the proprietors 15 per cent. of the gold won as a royalty, and also at the rate of 10s. per ton for all stone crushed. The water used for the plant is pumped by steam from the creek, a distance of nearly 2 miles. The pyrites have been hitherto stacked for after treatment, but it is in contemplation by the proprietors to erect a roasting furnace and a Chilian mill for their complete and profitable reduction. The samples, as exhibited, appeared to be exceptionally rich.

In the immediate neighbourhood of Gulgong proper and of Home Rule, the yield of gold, partly no doubt from causes referred to in the earlier portion of this report, has noticeably fallen off, the total being 11,461 ozs. 8 dwts. 11 grs., against 18,446 ozs. 5 dwts. 17 grs. won in 1876. The smaller number of miners (511) who have taken out miners' rights at the Gulgong office, accounts in some degree for the diminished yield—still, such is the confidence felt in Gulgong as a mining centre, that a large proportion of the miners have taken up residence areas suitable for orchard, vineyard, and horticulture generally, and have permanently established their families, upon the probability, no doubt, of eventually succeeding in their persevering quest for gold.

In the vicinity of Mudgee, the principal gold-field at present in a payable condition is situated upon the freehold of Mr. William Henry Lowe of Eurunderee, and popularly known as the Log Paddock.

Several of the upper claims upon this lead have yielded well during the last year, though the lower numbers are handicapped with an excess of water in the drift, which leads to much expense and delay. This characteristic it possesses in common with many of the Gulgong and Home Rule claims, in leads where the higher claims have been richly auriferous. Already steam has been employed, and it is thought that the tide of profit will again rise as the obnoxious element (in that connection) lowers.

About 7 miles to the southward of Mudgee, near the Main Sydney Road, and on the bank of the tortuous Cudgegong River, lies the alluvial diggings of Mullamuddy, where at one time a considerable quantity of gold was taken out from a shallow bottom. A portion of the hill overlooking the alluvial flat was at one time sluiced by a company, the shareholders of which erected extensive machinery under the impression that a very large area might be profitably stripped. But the yield, though occasionally such as to encourage expenditure, did not continue, and the flumes, races, and pumping-gear only remain to point the usual mining-company moral. However, small parties of miners may still be seen there for weeks or months, as at the neighbouring diggings of Apple-tree Flat. The surfacing in both places occasionally suffices for a livelihood.

Quartz reefs have been worked in both these localities, with varying signs of success, and crushing machines erected upon private ground. Some stone from Mr. Pauling's paddock has been crushed, I am informed, with fair results within the last few months, but as yet no permanent reef has been developed in the neighbourhood. In the Cudgegong gold-field, about 15 miles westward, is situated a Cinnabar Mine, formerly worked by an English proprietary in conjunction with one or more local shareholders. The original prospects were extremely promising, but though a considerable outlay was incurred during the first two years in building shafts and machinery, the common blight of so many mining enterprises seems to have fallen upon the affair, and the works are now idle, though the property still remains in the hands of the company. Good indications have been found of other minerals in the neighbouring hills, which are extremely metalliferous in appearance, but no associated action has ensued.

In the highland region of the Meroo River and Louisa Creek, now known as the townships of Hargraves and Windeyer, the scattered mining population, not numbering above 220, are chiefly engaged in river and creek claims, sluicing when a supply of water is available, and at other times searching for the pockets which are often found in the river bars and banks. More than 2,000 ozs. of gold has been forwarded by escort during the past year from these localities. It is possible, as a large number of the miners are Chinese, that this amount does not represent the whole quantity obtained. The mountain streams which pervade this district have been unusually low during the past year, causing many water-races to lie idle, from the action of which the owners (some of whom have gone to great expense in their formation) were in other years secure of certain if not excessive profits. As in other portions of the Mudgee Mining District there are certain reefs which are still confidently held by their leaseholders, who believe that the locality which produced the historical hundred-weight of quartz-gold which caught the eye of Dr. Kerr's aboriginal shepherd in 1851, must yet contain other rewards for the dauntless constancy of the prospector.

At Maitland Bar, another of the once successful alluvial encampments, the traces are still strikingly visible of a large and well-rewarded mining population—races carried through rock and under overhanging mountain walls, attest the labour and capital profusely bestowed upon presumably remunerative works in the flush of mining prosperity. Large areas of river-bank have evidently been stripped by sluicing, but in very few instances are the original projectors remaining to tell the tale of fabulous profits and gradually diminishing yield. It is understood that the miners located here do as well in proportion to numbers as in any of the diggings in these decayed mining townships. They are certainly, in many instances, comfortably lodged, the tiny orchards surrounding their huts upon the river-banks or promontories, with the rippling waters below, giving a picturesque and pleasantly secluded air, often wanting in residence areas.

At Avisford many of the miners are Chinese, and no doubt sell their gold to a countryman storekeeper at Long Flat, who has been established in the neighbourhood for several years.

At Grattai, upon the creek of that name, about 12 miles south-west of Mudgee, tolerably rich alluvial deposits were at one time secured. The traces of shallow sinking are continuous upon all the flats of the minor water-courses leading into the main creek. Reefs have been found in the locality and worked to a certain extent, but no payable quartz has been proved. At Oakey Creek, about 2 miles distant, and nearer to Avisford, a reef has been opened out for several feet, and 30 or 40 tons of stone brought to grass. But no sufficient indications of its being payable have as yet been furnished by the prospectors. Without doubt these minor diggings contribute more gold than might be supposed to the monthly escorts, and it is by no means improbable that at any one of them an unusual find may direct capital once more to the neighbourhood of Old Louisa Creek, to the recovery of its once famous prestige.

Little doubt exists in my mind but that rich cupriferous lodes will be developed in the neighbourhood of Mitchell's Creek and Wellington, when the transmission of ore and other products and mineral requisites shall be afforded at a cheap rate by the approaching railway. Ample supplies of timber suitable for smelting exist in the neighbourhood. When the furnaces of the Kaiser and Belara Copper Mines are in operation, it is a matter of certainty, judging from the richness of the grey ore exhibited to me from other localities, that many lodes will be opened to benefit by smelting facilities. This branch of mining industry may be accurately stated as being in its infancy in the neighbourhood of Wellington, on either side of the Macquarie, and I look confidently forward to the yield of copper as being fully equal if not superior to that of the more precious metal, when fairly supplied with appliances for its extraction.

The untoward season which has fallen with peculiar severity upon the land watered by the Macquarie, has, by rendering fodder almost unprocurable, delayed operations which would perhaps ere now have tested the question. No section of mining industry has escaped apparently the damaging effect of this long protracted drought, unequalled for forty years in severity. With respect to the general yield of gold in the Mudgee District, the falling off in certain localities is counterbalanced by the increase and probable development of gold-fields in others. No doubt, in such centres as Gulgong and Home Rule the falling off from former years has been marked. But it must be borne in mind that no year since 1870 has been so unfavourable to mining prospects generally; in no year have so many circumstances militated against the rational unspeculative testing of our gold-fields; in no year has the public been so unwilling to invest money in promoting mining enterprise.

It is well known that miners as a rule are not capitalists, even though they number some amid their ranks who have been unusually fortunate. They are often aware of mining property which can be profitably worked by the aid of capital, but they are unable to procure it. Their own labour they would freely give.

A claim lately worked by co-operative association at Home Rule, known as the Red White and Blue, is, however, a pleasing instance of the manner in which a party, for the most part working miners, have successfully surmounted these difficulties. This claim, bottomed upon a run of wash-dirt tolerably payable, and believed to be a continuation of the Lowe's Paddock Lead, is situated upon the lowland of the Cooyal Creek. On the opposite side lies, upon Crown Land, the alluvial diggings known as the Shallow Rush, one of the richest patches of gold-bearing drift ever worked at Gulgong. The claim referred to, after a long struggle on the part of the shareholders to keep down the water, which being below the level of the creek poured in ceaselessly, was abandoned. For more than two years nothing was done with regard to it, though it was always spoken of as good property if the water could be vanquished.

After much consideration it was again taken up in eighteen shares, one of these being apportioned to the owner of the steam-engine necessary to work the pumping gear. The plant, which comprehended winding gear, the property of one of the shareholders, was, when fully completed, one of the best ever erected on this gold-field. The engine pumped the water, raised the mullock, and worked a puddling machine which, on a level with the top 30 feet in air, received the surplus water and the wash-dirt for sluicing. One engine-driver and one top-man sufficed for these distinct operations. The water having been successfully combatted, a good run of wash-dirt of more than average depth was rendered available, and a handsome dividend secured to the enterprising shareholders.

The successful results thus attained in this claim may be held to establish the fact of there being extensive deposits of wash-dirt yet unworked upon this gold-field, occurring chiefly in the deeper leads, and needing steam machinery for the necessary drainage, but sufficiently rich to recompense all reasonable outlay. This claim is situated in freehold land, but it is thought that it may be the means of tracing the original lead into Crown Lands, where the deeper ground cannot be said to have been fully tested.

The long abandonment of this payable claim is but the history of much presumably auriferous ground upon the Lower Black Lead, the Moonlight, the Star, the Buchanan, and the Britannia, which all miners of experience are fully aware has been by no means adequately tested. If it be the intention of this Government at any time to subsidize prospecting parties in localities where, with strong presumptive evidence of the existence of gold, based both upon scientific and practical reasoning, the expense of thorough testing is too great to be borne by ordinary miners, these are the vicinities to which I would respectfully draw the attention of the Minister for Mines. Any distinctly favourable result proved beneath the basalt masses and subterranean reservoirs which characterise the deeper leads of Gulgong and Home Rule, would at once, by proving the value of those formations, attract capital and systematise discovery. In support of this statement, I have been informed that the holders of No. 23, Black Lead, have met with undoubted signs of a run of deeper ground than any yet worked, perhaps exceeding 200 feet in depth, which they consider to be the true course of the main gutter of the Black Lead, lying to the north-west of the present line of shafts. From the expense they are at present forced to incur in keeping down the water in their claim, they see no prospect of being able to attempt the working of the more ancient and possibly the richer bed of that long-buried stream. In conclusion, I may state my opinion that although the yield of gold has unquestionably, from a variety of causes, decreased during the past year, I see no cause to doubt the future progress and development of mining industry generally throughout the district which I have the honour to superintend. To assert that the auriferous lands of the district are worked out and exhausted, would be to determine a very important question upon imperfect and superficial evidence. Other minerals, notably copper, may yet become the means of promoting large industries and employing profitably a considerably proportion of the mining population. I would desire distinctly to enter my protest against any wholesale alienation of auriferous lands. It is impossible, judging from the past, to say at what period new and extensive deposits as rich as any at present known may be discovered within the boundaries of the Mudgee Mining District. The *bonâ fide* miner should at all times, in my opinion, be permitted to purchase sufficient land upon which to reside in comfort, but no general sale for agricultural or pastoral purposes of such land should be permitted, unless, as by the provision of the 14th section of the Crown Lands Alienation Act of 1861, the Crown retains the right to resume them upon proof of discovery of gold.

From a Schedule appended it will be seen that the amount of gold forwarded by escort from the different divisions of the district reaches the total of 24,143 ozs. 8 dwts. 15 grs., a value which, though relatively small compared with the gold-harvest of former and more favoured years, is not such as to create uneasiness with regard to the speedy extinction of our mineral resources.

Return showing the quantities of gold forwarded by escort from the divisions of the Mudgee Mining District during the year ending 31st December, 1877 :—

	ozs.	dwts.	grs.
Gulgong	11,461	8	11
Mudgee	7,411	9	23
Wellington	3,127	19	9
Hargraves	2,142	10	20
Total	24,143	8	15

LACHLAN DISTRICT.

(*Mr. Warden Dalton, P.M., Forbes.*)

I HAVE the honor to state, that during the year ended on the 31st day of December last, a continued deficiency of water for mining purposes has retarded the further development of the mineral wealth of the Lachlan Mining District, under my charge. All the creeks and watercourses, with the exception of the Lachlan River between the Belabula Rivulet and the town of Condobolin, have long ceased to flow, and the channels are for the most part dry.

Under these circumstances efficient prospecting is still impracticable, and mining operations are still confined to portions of the old workings in the vicinity of such collections of storm water as are from time to time available.

A large number of the mining population usually resident upon the various gold-fields within this district, unable from the cause stated to follow their avocations, have sought temporary employment on the pastoral properties to the westward, leaving their families in their several homesteads to await a more propitious season.

The quantity of gold won within the Lachlan Mining District during the year—

1874 was...	72,500 ozs.
1875	74,235 „
1876	29,731 „

and that obtained during the year 1877 has not exceeded 14,000 ounces.

With the year 1875 a drought commenced to the westward of the Australian main range that still prevails in all its intensity, and to this I attribute the dispersion and impoverishment of the mining population, and to a considerable extent the falling off in the yield of gold, as I do not believe the auriferous deposits to have been exhausted, or any portion of the deep alluvium of this district with rare exceptions to have been fairly prospected. The heads of leads alone have been worked, with the easily accessible portions; they have not been systematically followed.

As an example of this, the surface of the deep ground round the southern base of the auriferous ranges at the Tyagong is yet unbroken. Here every quartz vein or reef contains gold, not always payable, but sufficient to prove the auriferous character of the primary series of rocks; here a cross-fracture in the granitic and greenstone belt that has enriched so many valleys between Grenfell and Young, is favourable for the aggregation of gold and the formation of auriferous veins, and here the whole drift from the basin of Emu Creek and the Seven-mile leads have been deposited and accumulated for ages. Then, the deep alluvium of the valleys that wind round the granitic hills on the eastern side of the Grenfell Range have been worked just enough to prove that they contain payable gold, and that that gold is derived from that portion of the range intervening between the Milkman's Gully and the Prussian and O'Brien's Reefs. The last block of O'Brien's Reef discovered, and now being profitably worked by tributors, points in that direction—at 160 feet in depth it is making to the eastward.

Still referring to the neglected deep leads on the Lachlan Gold Fields round Forbes, the gutters of the several leads have all been hastily worked to the deep and wet ground and there abandoned. The smallness of the claims prevented the application of the machinery and plant necessary to enable the holders to contend with water, quicksands, and swelling schists with any prospect of success. With such imperfect appliances as were used in shallow and sound ground, and in constant dread of accident, the miners had no thought of reef-wash or benches, and when they had broken into the adjoining claim and sent up the last bucket of wash from the gutter they were only too glad to abandon their holding. Besides, miners in those days, who knew that they had wash before them that would yield from 10 dwts. to an ounce to the bucket, would not willingly loose time in dangerous ground in sending stuff to the surface that would not return more than an ounce of gold to the load. In every instance there was a strenuous effort made by each party to get their share of the gutter worked out before that of the adjoining shareholders, fearing that if these men were worked out, and abandoned the lead before they had secured the best of their wash-stuff, they would lose it, as they knew that single-handed they could not cope with the water and other obstacles that were known to overlay the auriferous drift. These difficulties, in an aggravated form, present themselves to small co-operative companies without capital at the present day. These men know that the leads are not exhausted—that the reef-wash, benches, and tributaries are still virgin ground—that a channel in the older tertiary drift crosses the richest portion of the gold-field, and at a depth of 330 feet has not been bottomed—that that channel must in ancient times have received the local drainage, and that the discovered leads were in all probability tributary to it. Knowing all this they hesitate to face ordinary mining difficulties that are of common occurrence in other parts of the world, and are invariably overcome by skilful engineers and the application of capital.

As a proof of the hasty manner in which the Lachlan leads have been run over, in the face of an accumulation of engineering difficulties, it is only necessary to state the time occupied in the work.

About January, 1862, a few rich claims in the alluvial flats at the base of the ridges on the north bank of the Lachlan River had been discovered, and were soon proved to be the head of the first lead worked in New South Wales, and within *four* months 28,000 persons were encamped where Forbes now stands, and a modification of the frontage system had been introduced.

The original discovery was named the North Lead, and its continuation to the River Lachlan the South Lead, and upon the latter, at depths from 110 to 150 feet progressively, eighty-two (82) claims had consecutively struck payable gold; at the same time two patchy and irregular leads were opened on the opposite or eastern side of the granite dike, that running north and south appears to have altered, fractured, and silicified the Silurian grits, sandstones, limestones, and chloritic slates and shales interstratified upon its flanks. The head of the North Lead had been lost amongst the ridges, where a shaft had been sunk to a depth of between 300 and 400 feet and no bottom reached; and by the 30th of June 132,933 ozs. 5 dwts. and 3 grs. of gold had been transmitted to the Mint by escort, and up to the 31st of December an additional quantity of 102,110 ozs. 11 dwts. and 10 grs. was forwarded to the same destination by the same means, making a total of 235,043 ozs. 16 dwts. 13 grs. for the year; and by Christmas Day, 1862, the population had decreased to 12,000 souls.

During the ensuing half-year, ending on the 30th of June, 1863, 50,818 ozs. 19 dwts. 22 grs. of gold were forwarded to Sydney also by escort, and the population on the Lachlan Gold Fields was further reduced to 3,500 souls, including those engaged in working auriferous quartz reefs on distant outlying gold-fields.

I do not believe that at any time more than one-sixth of the people were actually occupied in mining operations. The remainder was made up of speculators, traders, mechanics, professional men, women and children, and camp followers, amongst whom the criminal classes were well represented.

In June, 1863, the gold-fields of New Zealand became the centre of attraction, and the miners on the Lachlan, unable to resist the wealth of the Shotover, migrated by thousands.

It is thus evident that the Lachlan Gold Fields could not have been effectively worked in eighteen months, and that, notwithstanding the enormous yield of 285,862 ozs. 16 dwts. 15 grs. of gold within that period, the deep leads could not have been tested. Not a single lead has been traced to its termination, or further than could be done by unassisted manual labour.

I am not aware that any portion of the old leads upon the Lachlan Gold Fields have been worked a second time. So confident was Mr. Gold Commissioner Brown that the ground had not been efficiently worked, that he desired to lease the several leads before they were abandoned by the first occupants, so that the lessees might in such dangerous workings be in a position to immediately replace those retiring, and thus have the advantage of the old shafts and drives.

The foregoing facts, dates, and figures, as respects the Lachlan Gold Fields, are collated from official records in my office.

Proceeding further north, we find the Welcome Lead lost in the wet and deep ground where it was most productive—the Bushman's Lead lost in the bed of an ancient lagoon where it was also rich in gold—M'Guiggan's South and the London Leads also lost in deep ground—and the Ben Nevis workings confined to ledges in the vicinity of the ancient bed of a river. In the neighbourhood of more than one of these ancient streams, Upper Silurian or Devonian fossils are abundant, chiefly amongst altered calcareous sandstones.

There is some probability of the deep ground at the Upper London Lead being now worked with profit.

The quantity of gold transmitted to the Mint by escort from the Billabong Gold Field during the year 1877, was 9,204 ozs. 14 dwts. 3 grs.; of this, 1,347 ozs. was the produce of drift raised from the Welshman's Claim in 1876, not estimated in that year's report—washed in 1877.

Prospecting.

With the exception of the search for gold pursued with much energy during the year by A. B. Pyke and party, but little has been done beyond proving where it was not. The party referred to have with indomitable perseverance prospected one half of a north-and-south gully of about 8 miles in length that, situated on the eastern boundary of the Lachlan and Billabong Gold Field, heads in the porphyritic granites of the Eurowa Mountains. At a depth progressing from 125 to 180 ft., chloritic slates and shales rest upon a friable and moist porphyritic granite along the entire length of the ground tested. Gold was found in quantities of from 1 to 12 grs. to a dish, in a quartz gravel wash of from 1 foot to 18 inches in thickness. The latter prospects were rare and were chiefly obtained from the soft granites on the eastern side and in small patches; tributaries were numerous. The gold obtained was not deemed payable, and after sinking thirty-five shafts, as they found the lead rapidly improving, the funds of the party became exhausted, and the place was abandoned.

Subsequently the storekeepers at Parkes subscribed a small sum to enable the same party to prospect the country along a line of gold-bearing quartz veins from 8 to 20 miles due north of that town; Pyke and his mates worked hard for two or three months, and sank many shafts in the vicinity of water; by this last they were obliged to regulate their movements; the result was unfavourable. Two or three other parties were out during the year, chiefly in the direction of the heads of the Bogan River, but did not find payable gold.

It is probable that if a party of unmarried men were kept constantly in the field, and were assisted to the extent of tents, tools, and rations for about three years, some valuable discovery might be made. Whether this should be done at the public cost, or left to await the action of private enterprise, is a matter for consideration. The difficulty will be in avoiding the jobbery and interference of patriotic agitators and electioneering agents, who have always an eye to the local expenditure of public money, to the end that the greatest advantage may accrue to the greatest number.

The boring machine although offered on the most favourable terms to several parties has not been used, the condition that those to whom it was lent should cause it to be used was thought to be too stringent. Speculators and adventurers, usually to be found on the trail of the gold miner, to the prejudice of the mining interest, still persist in knowingly encroaching upon valuable portions of the Crown Lands within these gold-fields, situated within areas reserved from conditional purchase. Relying mainly upon importunity and misrepresentation, they do not hesitate to treat the law with contempt, pretending to be ignorant of its provisions.

The officers of the Mining Department are very properly prohibited from speculating in mines, and I consider that if those employed by other departments of the Government were similarly restricted with respect to reserved land within gold-fields, it would be equally conducive to the public welfare.

The *bonâ fide* miner in search of a site for a homestead near the scene of his labour rarely exceeds the 2 acres to which he believes himself conditionally entitled. I am of opinion that the residence area allowed by the Mining Act is too small, and that at the distance of half a mile from the boundary of any town within a gold-field, or from any gold mine in the occupation of miners, it might be extended to 2 acres, upon condition that three-fourths of that area may be temporarily resumed without compensation for mining purposes if required. On special portions of a gold-field the area might be extended to 10 acres, under a permit in the nature of a miners' right at a cost of 10s. to be renewed annually, each miner not to hold more than one portion, and such portion not to be transferable or subject to the process of civil law. The effect would be to fix a population on the gold-fields in the several mining districts.

Emu Creek and Tyagong Gold Fields.

On these gold-fields during the past year the yield of gold has been slightly in excess of that of the year preceding it; the increase having been in the production of the quartz reefs, while the gold won from the alluvial leads has been less than that of any year since 1866.

About fifty miners in the aggregate have been employed at intervals during the year when water was available for mining purposes upon the undermentioned leads and that was of rare occurrence:—

The Milkman's, depth 150 feet; yield, from 10 to 4 dwts. per load.
The Two-mile, depth 150 feet; yield, 6 dwts per load.
The Quandong, depth from 150 to 200 feet; yield, 3 dwts per load.
The Seven-mile, depth 90 feet; 6 to 10 dwts. per load.
Average thickness of wash, 18 inches.

Of these the Milkman's and the Seven-mile contain the richest auriferous deposits at the present time.

Quartz Mining.

The senior reef, O'Brien's, was opened about November, 1866, and up to the date when the Grenfell Consols Gold Mining Company became the purchaser of the prospecting claim, and No. 1 North, with No. 1 South, those three small claims had produced 33,494 ounces of gold.

Since the formation of the company, mining operations have not been attended with so much success, as the reef at the north end broke off, and its continuation could not be discovered. About May last a party of four tributors undertook the search, and at a distance of 17 feet to the eastward, and 160 feet below the surface, found a block 5 feet wide, trending easterly, which they have been continuously working up to this date, and from this they have procured 578 ozs. of gold, the last crushing of 39 tons giving 34 ozs. A continuation of the line would pass through the head of the Prussian Reef, across a hill of Silurian slate, granite, and porphyrite, and into a part of the Milkman's Gully that has been mined upon for years by Keir and three others, who inform me that they have always made from £2 to £5 per man weekly, or to use their own words £3 all through.

I am convinced that there are several payable reefs between O'Brien's, the Star Gully, and the Milkman's Lead—two, the Young O'Brien and the Prussian have each been worked, and both produced some unusually rich stone. The continuation of O'Brien's evidently lies well to the eastward.

The Victory Reef, Allsop and party, situated about 100 yards to the south-east of O'Brien's, near the slate formation, from the depth of 260 feet, has raised a large quantity of quartz that averaged 8 dwts. of gold per ton. On the southern side of this block of slate the porphyritic rock again crops through the surface, and is here intersected by a series of what were the richest reefs on these gold-fields. These have been worked to a depth of 350 feet, and are now idle. Beyond these, a quarter of a mile from O'Brien's to the south-east, is the Enterprise Reef. This has been worked for nine years. The formation is porphyrite and granite. At a depth of 370 feet the reef ranges from 1 to 3 feet in width. On the 6th of December last, 72 tons 3 cwt. of stone from the 200-feet level produced 90 ozs. 12 dwts. 12 grs. of gold.

Several other small parcels of quartz, from various reefs, have been crushed from time to time during the year, chiefly with profitable results. The particulars of these will be furnished by the Mining Registrar.

There appears to be a growing desire amongst the quartz miners of Grenfell to re-occupy many of the old reefs, now locked up by leases issued under the Gold Fields Act of 1866, and that have been idle for a long period. The sooner such leases are cancelled the better for the mining interest.

Exclusive of that purchased by the Bank of New South Wales, which was closed in July last, the quantity of gold purchased by the Banks was 1,440 ozs., which, with 300 ozs. sent to Young and transmitted from thence by private hands, makes a total of 1,740 ozs; this is the quantity won by about 100 miners, working on an average not more than half time.

The quantity of gold forwarded to the Mint from Grenfell during each of the years 1867, 8, and 9 was not less than 42,000 ozs., the greater part of which was won within an area that might be covered by a farm of 50 acres.

The country between Grenfell and the Abercrombie River has not been prospected, particularly the Kangarubie Ranges, although gold has been frequently found there by persons employed on stations. Further east, on the opposite bank of the Lachlan River, are some of the oldest gold-fields in the Colony.

Lachlan Gold Field, Forbes.

With respect to the progress made in the development of these gold-fields during the past year, I have nothing to add to the detailed statement of the Mining Registrar.

The Madman's, Grasset's, and other very short but rich tributaries to the most productive portion of the South Lead, have been found to have their source in an altered gritstone dike or belt that extends due north from the Britannia reef; some very rich patches of gold-bearing quartz have been found in leaders or veins, interlaced with this altered rock, and Devonian or Upper Silurian fossils in abundance have been also found in a similar formation but of a finer grain in the vicinity. This grit, in contact with granite, crops up on Thompson's Hill, 2 miles further north, and wherever it has been found on this gold-field the yield has been extremely rich; that this dike contains the gold is beyond doubt, as it has been obtained from the rock *in situ* from several parts at long intervals of distance. Situated not more than 300 yards from the South Lead on its western bank, and being nearly parallel to it, having a northerly strike, it has not been followed. Some of the water along the line of strike is as salt as brine, while at the same level and at no great distance it is found pure and fresh.

I enclose a letter addressed to myself on the subject of the Lachlan Gold Fields, by Mr. Philip Davies, one of our ablest and most experienced mining managers.

The quantity of gold transmitted by escort from Forbes during the year 1877 was 193 ozs. 19 dwts 17 grains; a large portion of the gold obtained at the Bald Bills was sold to the Commercial Bank at Parkes.

The Billabong Gold Field.

The development of this field, in common with all others in the district, has been suspended in consequence of a deficiency of water.

No new leads or auriferous deposits of value have been discovered since 1875, nor is it desirable that there should be until the drought has been broken by a heavy and continuous rainfall.

The number of working miners is much reduced, and the aggregate quantity of gold won has proportionately decreased; however, that obtained per man by those actually employed in mining is not below the average.

To arrive at the value of gold mining as an industrial occupation, those only actually employed in mining operations should be taken into account, as well as the number of months that they have been so employed during the year. The host of sutlers and miscellaneous camp followers that gather round a new rush ought to be carefully excluded. The support of these is a heavy charge upon mining industry; except as consumers they are of but little value to the country.

Alluvial gold mining during the year has been generally limited to the reef-wash, pillars, and angles that have been overlooked by the first occupants of the several leads, and this species of fossicking has in many instances been carried on with profit.

The character of the mining that has been prosecuted on the various leads will be best understood by a perusal of the following statement as to what has been done:—

The No Mistake, 2 miles long, depth 100 to 120 feet; on the lower end six claims, worked by eleven men occasionally, wash 12 inches thick. 500 loads yielded 4 dwts. of gold per load.

On the upper end, two claims, occasionally worked by six men, 400 loads, average yield 3 dwts. per load. Water for mining purposes rarely available.

Reid's Gully, 3 miles long, upper end only now worked, depth 40 to 80 feet, water scarce; five claims, eleven men, 800 loads washed, lowest yield 3 dwts., highest 8 dwts., average 6 dwts. of gold per load.

Bushman's Lead, north-west branch, depth 60 to 80 feet, thicknes of wash 15 inches; nine claims worked at intervals throughout the year, average produce of reef-wash, 4 dwts. of gold per load.

Bushman's Lead South, depth 75 to 90 feet, eighteen claims not continuously worked, fifty-six men; yield from reef-wash and angles, lowest 3 dwts., highest 9 dwts. of gold per load.

Sardine Gully, 1½ mile long, a tributary of Bushman's South, two claims working, four men; average yield per load 4 dwts. of gold.

Upper Welcome Lead, depth 70 feet, wash 12 inches thick, three claims, eight men; average produce 4 dwts. of gold per load.

Lower Welcome, depth 100 to 132 feet, reef-wash 12 to 18 inches thick, 11 claims, thirty-two men, not continuously worked; yield of gold, lowest 3 dwts., highest 6 dwts., average 5 dwts. This lead has not been followed into the wet and deep ground.

'Possum Gully, a mile in length. A westerly tributary of the Bushman's, opposite the town of Parkes, depth 50 feet, reef-wash (on the western side) 12 to 18 inches thick, seven claims; twenty-five men worked continuously during the latter part of the year; yield of gold from 3 to 5 dwts. per load; has its source in a mass of auriferous reefs on the Caledonian Hill; formation porphyritic granite and diorite and altered slates in places decomposed to a considerable depth.

Frenchman's Gully, surfacing area, in the vicinity of several large areas of auriferous surface at the heads of the various branches of the Bushman's and the Welcome Leads, no water, five claims, ten men, depth of wash from 2 to 3 feet; yield of gold, lowest 3 dwts., highest 6 dwts. per load.

Richardson's Gully, one and a half mile long, 40 to 60 feet deep, thickness of wash 12 to 24 inches, six claims, fourteen men, average yield of gold 4 dwts. per load, has produced some heavy nuggets, nearly surrounded by quartz reefs many of which are gold-bearing, from some very large and valuable portions of quartz containing masses of gold have been obtained. On this part of the gold-field every valley has carried a rich lead, and every hill contains a network of quartz reefs intersecting gold producing rocks.

Victoria Lead, having its source in a mass of gold-bearing quartz reefs, depth 14 feet, thickness of wash 6 to 18 inches, water so scarce that the miners use the primitive tub and cradle, seven claims, eleven men, average yield 3 dwts. per load.

The London Lead, about 3 miles long, but only occupied now and during the past year near the head, from 35 to 83 feet deep as far as No. 21; below that claim a channel 160 to 170 feet deep crosses the lead, or what may hereafter prove to be the bench workings. This channel has recently been found to contain a poor wash-drift about 8 feet in thickness; whether this is payable has not been ascertained. The existence of this main water-course has been long known, as it was discovered on the first opening of the lead; it has been also found to cross the Ben Nevis Lead half a mile further to the west, traversing Upper Silurian or Devonian grits, shales, and limestones; what its value may be with respect to gold-bearing deposits, or what course it pursues to the lowlands remain to be discovered; parallel leads at varied depths have been worked profitably as far as this channel and no further, and an immense deal of labour was expended in the search of their continuation to no purpose. On the opposite bank of this deep ground the depth decreases to between 80 and 90 feet, but has hitherto proved valueless as respects gold. During the year, mining on the Upper London Lead has been confined to that portion between Nos. 15 and 23; six claims have been fairly worked by about thirty men during the early part of the year, latterly the number has been reduced to sixteen, the lowest yield of gold was 3 dwts., the highest was 5 dwts. per load.

M'Guiggan's Lead North, within half a mile of the Goobang Creek; a cluster of five claims, on or near the site of Cooke's original prospecting claim have been worked by fifteen men, wash-drift from 12 to 18 inches in thickness, average yield of gold 4 dwts. per load.

About fifteen miners have been occasionally employed upon the Tichbourne and Wapping Butcher Leads during the year, fossicking the abandoned claims; some of these were repaid for their labour by finding rich but small patches that had been left for the gleaner.

It must be borne in mind that all the leads that I have enumerated were supposed to have been exhausted during and prior to 1876.

The quantity of gold-bearing drift raised from all the leads on the Billabong Gold Field, during the year ending on the 31st of December last, was about 36,500 loads, which produced an average of 4 dwts. per load; 3 dwts. from old workings where the ground is sound and dry, and requires but little timber, is worth the attention of those who cannot find more profitable employment.

Quartz Mining.

To recapitulate the names of all the quartz reefs and veins upon this gold-field that have been proved to contain gold, would occupy several pages. From one of these reefs 300 ozs. of gold has been obtained in 1863 from two buckets-full of rubble stone, while nothing payable was subsequently obtained from the same vein.

In many other reefs small but rich patches from 5 to 25 lbs. in weight have been found, that would average from 500 to 1,000 ozs. of gold per ton, while outside these the stone, although containing gold so far as tried, did not prove to be worth crushing.

During 1862, 1863, and 1864, the Billabong was celebrated for its quartz reefs. Nine of these were worked efficiently. Near the surface the produce was from 2 to 3 ozs. of gold per ton of stone; this gradually decreased until at the depth of 150 to 180 feet a change in the investing rock occurred; below this the respective mines did not pay the expense of working when the place was abandoned.

Admitting that the Billabong quartz reefs are not remunerative below the depth named, there are hundreds of gold-bearing reefs scattered over the district that have not been opened to the depth of 20 feet, and then only to the extent of ground covered by a prospecting shaft. With the knowledge that no reef or vein is equally metalliferous throughout its course, and that its auriferous contents are entirely dependent upon the gold-producing rocks traversed by the fissure, their joints and fractures, and the chemical agents and solvents permeating them, no person can assert that any one of these reefs has been sufficiently prospected.

During the short period that the mining industry of New South Wales succumbed to the mesmeric influence of "The Corner," it was no uncommon thing for the finding of a valuable specimen to be the signal for a cessation of work upon a reef, and in many instances it has never been resumed.

No new reefs have been opened during the past year, and no important operation in quartz mining has been undertaken. Upon the Bonnie Dundee Reef a few claims have been worked with some energy; the highest yield per ton was 16 dwts. A detailed statement of the several parcels of quartz from the old reefs round Parkes that have been passed under the stampers will be furnished by the Mining Registrar.

The Ada Quartz Reef, situated upon the Barmedman Run on the Lower Bland Creek, and distant 65 miles from Grenfell and 75 miles from Young, traverses a formation of slate interstratified with sandstone, with quartz reefs, metamorphic rocks, and igneous dikes exhibited on the ridges in patches.

The Ada Reef has a north-easterly and south-westerly strike with an easterly dip, and has been proved to be auriferous at intervals along between 600 and 700 feet of its length, a trial crushing of 5 tons 9 cwt. of stone from No. 2 North having produced at the rate of 3 ounces of gold per ton; and from other portions of the same claim as much as 6 dwts. of gold per cwt. are reported to have been obtained by hand crushing in a mortar. On the surface the width of this reef was about 18 inches, at a depth of from 50 to 60 feet it is said to range from 3 to 5 feet. The water made in the deepest shafts is strongly impregnated with mineral solutions, amongst these chloride of sodium predominates. It is as salt as brine.

There are several shafts upon this reef, the deepest about 70 feet. A steam-engine and crushing plant are in course of erection near the reef, where a large quantity of stone awaits its completion.

To secure a supply of fresh water is one of the chief difficulties that the miner will have to encounter.

In formations similar to that of the Barmedman country, it is not uncommon to find aggregations of gold in small patches of stone, while that obtained from the reef or vein as a whole will not pay the cost of extraction. Until 200 or 300 tons of stone from the Ada Reef have been passed under the stampers, its value will remain uncertain.

The Cargo Gold Field.

This field, although usually the last to suffer, has not escaped the effects of the drought.

Alluvial mining has been chiefly confined to Gum Flat, where five claims have been worked during the year. Here, on the margin of the great limestone belt that traverses this part of the country, at a depth of 300 feet, an apparently inexhaustible quantity of auriferous drift producing about 4 dwts. of gold per ton can be obtained from subterranean pipes and water-courses. Occasionally a small number of miners occupy portions of the worked-out gullies descending from the Ironclad Range, but rarely continue at such employment, as the gold obtained is hardly remunerative.

The Ironclad lode has not been worked continuously during the entire year, as the supply of water became exhausted. The company's mine is in the same condition as at the date of my last report. There are several leaseholds on the same lode, and upon these mining has not been prosecuted with energy; this chiefly arises from want of capital. No greater evidence can be presented of the folly of persons without means taking up valuable mineral land that cannot be worked without a large outlay, than, with one exception, the several leaseholds on the Ironclad Range. Some of these have been held in reserve, but I have informed the respective lessees that at the expiration of their term they must either work the ground effectively or relinquish their holdings to those that will.

At the Panuara or Four-mile Creek, no mining operations have been carried on during the year, except by one party surfacing near its junction with the Belabula Rivulet.

The basin of the Panuara, with its tributaries and parallel creeks, from its source in the Canobolas to its junction with the Belabula, is worthy of the attention of gold miners, more particularly the spurs and the heads of the tributaries. I have more fully described this broken and rugged but beautiful locality in a recent report.

The population of Cargo is about 300, of these fifty are gold miners, twenty of whom have been employed by the Iron Clad Company. More detailed statements will be furnished by the Mining Registrar.

The quantity of gold won during the year has been about 1,200 ozs.

There has been no mining for metals other than gold on the Cargo Gold Field.

Cudgellico Lake Gold Field.

Gold mining upon this field still continues to be restricted to the operations of the Foster's Reef Gold Mining Company. Up to the last few months this mine has not been paying its working expenses, but the prospect is now more cheering, as the stone in depth increases in value, that from the 140-feet level having yielded 1 oz. 5 dwts. per ton. The Manager's Report is herewith enclosed. It appears that no expense has been spared in the development of this mine. This is of immense import to the gold mining interest, as there is reasonable ground for the belief that such belts of auriferous and otherwise metalliferous country, are scattered over the whole of the vast South-western interior, where the Silurian formations pierced by dikes and masses of granite, porphyrite, diorite, and other gold-producing crystalline rocks have been denuded. The Yellow Mountain, Barmedman, and Tumble Plains are all of this class of country, and upon all gold-bearing reefs have been discovered; the latter has not been worked, although the fair sample of stone, in which no gold was visible, sent by myself to the Mint, contained an average of 4 ozs. of gold per ton. I could quote many other instances of a like description, particularly in the country between Cudgellico and the Bland.

The quantity of gold won from the various mines within the Billabong Gold Field during the year 1877, I estimate to be as follows :—

	ozs.	dwts.	grs.
From alluvial leads and workings	7,300	0	0
From quartz reefs and veins...	1,636	7	11
	8,936	7	11
Add to this, held by the Banks on the 1st January, 1877, the produce of 1876	548	17	7
	9,485	4	18
Which was thus disposed of—			
Transmitted to the Royal Mint by escort	9,204	15	4
Held by the local Banks, 1st January, 1878	280	9	14
	9,485	4	18

Value in Parkes, £3 15s. per ounce.

(*Appendix A to Mr. Warden Dalton's Report.*)

F. Dalton, Esq., Warden, Lachlan Gold Field,—

My dear Sir, Consol's Company, Grenfell, December 27, 1877.

Having for many years taken more than passing interest in the auriferous character of the Lachlan Gold Field, especially the deep leads of Forbes, I purpose devoting a little of my leisure time during the holidays to say a few words on this all important subject,—trusting that my remarks may, at any rate, be of some interest to yourself and others who take pleasure in investigating the importance of the mineral wealth of this great Colony.

During my four years residence in that district, I had the pleasure of examining the leading characteristics of your important gold-field, as well as collecting valuable records in connection with the former workings of the South Lead as well as other ancient river-beds adjacent to the Lachlan Valley.

The close proximity and the particular situation of the outcrop of the Britannia Ridge of auriferous quartz, proves both in theory and practice that the disintegration of this long and well-defined gold-bearing outcrop, has been the means of supplying the South Lead, as well as all the other ancient beds in the neighbourhood of Forbes, Tichbourne, M'Guiggan's, and Parkes, with an immense quantity of the gold-bearing detritus that was so successfully worked of late years.

It is necessary that I should call your attention to the fact that the alluvial gutters of Forbes, especially the South Lead, were energetically although only partially worked for many thousands of feet in length during the years 1862–3–4, but owing to the drifty nature of the sinking, and the large quantity of water to cope with, the co-operative miners of those days were unable to carry on mining with any degree of system; indeed, this could not be wondered at, because the area allowed to each claim by law was only 40 feet square. This would at once practically be a stumbling block that would effectually prevent the miner from working the ground by aid of steam-power, yet the result of this primitive work proved highly remunerative to the miner, owing to the extraordinary gold-producing nature of the ground; but this hurried system of working deep leads by aid of manual labour, led those engaged to scramble for the best part of their blocks, and leave an immense quantity of auriferous wash unworked, yet some of those holdings yielded frequently as much as £10,000 worth of gold per claim, and simply for the labour of half a dozen men for a couple of months.

The late Mr. Shaw, of Adelong, made a statement to me a few months ago as follows:—"Myself and five mates worked out claim No. 56, on South Lead, Lachlan, in two months, and won 1,900 ozs. of gold; shaft, 126 ft. deep; size of claim, 40 x 40. The water being so very heavy, we were obliged to work only the richer part of the ground; we left any amount of wash-dirt on the sides of the gutter, that would yield 1 oz. per load. The side of the gutter and what is now termed reef-wash never was worked in the early days at Forbes."

Now, as I am possessed of abundant evidence from reliable miners, as well as my own observations, that only an infinitesimal part of this ancient river-bed was worked in the early days—and that owing to the great amount of water there was to contend with no mining has been carried on to any extent ever since—I can, with much confidence, give it as my opinion, that the whole of the old workings on the South Lead, from its source to the place where it intersects the present Lachlan River, would, by re-working by steam-power, turn out immeasurably more gold than was realized in the time of its prosperity.

It is of the greatest importance that the mining community should be reminded, that immense deposits of rich gold-bearing wash-dirt have been discovered in Victoria on the sides and ledges of deep leads, and reasoning by analogy and experience similar valuable discoveries should be found to exist on the sides and banks of deep leads in this Colony. It is well known that only a small proportion of the gold won from the deep alluvial mines of Ballarat was taken from what is termed the lead proper, "deepest channel," but by far the greatest quantity of gold was subsequently found to have lodged on either side of the ancient river banks—what is familiarly termed in the deep alluvial districts, "reef-wash." For instance, it is now nearly eight years, to my own knowledge, since the renowned Band and Albion Consols Company, Ballarat, broke through into the adjoining mine, the St. George, in the main gutter; so in reality the most if not all the deep ground had been taken out before that time, nevertheless that company have obtained tens of thousands of pounds worth of gold from reef-wash after their deep ground had been worked out.

As the deep leads of Forbes have already proved equally rich, as well as regular and defined in their deposits of gold-bearing wash in the *deep ground*, it is quite to the point to conclude that the banks of your deep leads, as well as those of the Ballarat Consols, will be found to contain immense fields of gold-drift of like deposit which was entirely overlooked by the early co-operative miner; indeed the surrounding geological features of Forbes strongly argue in favour of the existence of such reef deposits, and it particularly favours this theory as regards the *west bank* of the South Lead, because of its close proximity to the gritstone dike, where the well-known Britannia quartz lode exists. The detritus from this auriferous band of rock has formed three tributary gutters to the South Lead, viz.,—Madman's, Grassat's, and the Britannia. These rich tributaries have only been imperfectly and partially worked, like the main lead; but I feel certain that the whole of the western bank of this ancient river, as well as the banks of the tributaries, will yet produce immense quantities of payable wash-dirt. Such discoveries and good results can only be brought about by well-organized companies, with sufficient capital to carry on mining in an extensive and efficient manner, by the aid of machinery suitable for working mines of this class, such as pumping engines, winding engines, and puddling engines, also other detailed appliances connected therewith. This theory is equally sound with regard to the discovery of reef-wash deposits in the vicinity of Parkes and M'Guiggan's, especially the latter, after the leads will have been traced further to the lowlands, where they will be found to have re-formed in a well-defined subterranean water-course with high ledges of reef-wash on the banks.

As I am one of those who believe in the great wealth of your gold-fields, and that this country is somewhat indebted for its present great prosperity to the mining industry, which has already produced over 33 millions of sovereigns, without the State alienating one acre of land in exchange, it is as well to remind our representatives, once more, by quoting statistics, of what the Lachlan produced in the shape of gold in the years 1862–3–64; and, *en passant*, I think it well to call their attention to the fact that very rich patches of the gold-field are now daily being alienated through the system of the 2-acre blocks, thereby depriving the State of its best and most valuable land, and for what is immeasurably less than its intrinsic value, and at the same time preventing and narrowing the scope of the miner from following his natural and productive calling.

Mr. Commissioner Brown, the Government Officer in Charge of the Lachlan Gold Field during the days of its activity, has left records in his department, that from July 10th, 1862, to June 30th, 1864, the enormous quantity of 297,357 ozs. 19 dwts. 22 grs of gold was forwarded per Government escort to Sydney from the Lachlan deep leads; but this great quantity cannot be anything near the amount of gold won from the district during that time, for it was the custom of a great many miners during those days to sell only a part of his gold, keeping the balance in his possession with a view of selling at a higher price, either in Sydney or Melbourne, when on their way to other new gold rushes that caused so much excitement to the mining as well as the mercantile community when the discovery of gold was made in New Zealand and Queensland; by making full allowance for gold thus taken away, and not appearing in the Commissioner's returns, it may be estimated that during the short period of 2½ years at least 1¼ million sterling worth of gold was unearthed from the Lachlan Diggings, which was at that period almost exclusively confined to a few deep leads in the immediate vicinity of the town of Forbes. Now, is it not a wonder that a gold-field like this, which produced such immense wealth, has been allowed to collapse and remain in a perfect state of inactivity for the last fourteen years? One would think that the figures I have quoted are only extravagant conjectures, but the records that I have given are perfectly correct, and can now be examined in the Warden's office in the district.

I have gone to some considerable trouble in trying to find out why this alluvial gold-field was abandoned. The sequel is still a mystery, for I find that none of the leads had run out, and all of them without exception contained gold as far as they were traced, but not so rich as they were nearer to the source, yet no doubt sufficiently rich to pay immense dividends if worked upon a good system with the aid of steam-power.

The only reasonable solution that I can give as the cause of the abandonment of these leads is, that a great many of those small parties of miners left the field after working the best of their claims, with a view of rushing to other distant promising gold-fields—those that remained on the leads found themselves surrounded by the influx of water that accumulated in the claims that had been left—the water was found to be too great for those that remained—the small parties, one by one, had to give up working. This is precisely what occurred during the last four years to the deep mines of Ballarat, on the Sebastopol plateau, after the mines had been worked out; but unfortunately the deep leads of your district were abandoned before one thousandth part of them had been worked.

After having made diligent inquiry in regard to the nature, value, and extent of wash-dirt in the last claim worked on the South Lead, now called Westcoll's Shaft, I am credibly informed by many reliable persons who worked in that claim that the lead was exceedingly wide, and that in fact the sides of the gutter were never discovered, but that abundance of wash-dirt was found in all directions, and yielded from 4 to 10 dwts. per load, and that the water making in that claim could easily be kept down by a very small pumping gear, but that the greatest drawback for a small company was swelling bottom, soft schist, drifty ground, and bad ventilation, likewise a casual indication of fire-damp. It is hardly necessary to say, that all these trivial drawbacks to the individual miner could easily be got over by a company with proper management; swelling bottom is of common occurrence in the leads of Ballarat; flammable gas, when found in small quantities, as in this instance, can be got rid of without the least danger by the introduction of a proper sytem of ventilation.

Now, I ask any man of experience in alluvial mining, whether such alluvial gutter as I have herein described does not present sufficient inducement for speculation ?

I think I may go beyond this without the least fear of contradiction, and say that there is no business of any description in this country that will afford better profit than by carrying on mining on these deep leads. My twenty-five years experience in managing some of the largest mines in Australia gives me great assurance that my prediction with regard to the value of these leads are perfectly sound and reliable.

A great deal has been said, and perhaps boastfully, about the mineral wealth of New South Wales. Our great show of classified specimens at Philadelphia created quite a stir on the Continent of America, and for a while made all the world look with a jealous eye to the development of our mineral wealth ; but, before this country will succeed in working its mines profitably, the system of floating companies for so many thousands of pounds beyond their real value, and allowing the capital to drift into the hands of the jobber instead of opening out the mines, must be done away with. If capital is to be invested in this industry, let it be used *boná fide* for that object. What would a merchant or a squatter say, if they were induced to buy a business or a station for (say) £60,000, and afterwards find out that only £10,000 was paid for the property—the £50,000 being appropriated for the purpose of satisfying the greed of some unscrupulous commission agent, yet this system was carried out with impunity during the quartz mania in this Colony ; but our boasted wealth can never be unearthed under such ruinous custom.

In order to point out to you the practicability of working some of your deep leads at a profit, I have estimated (say) that the South Lead is 200 feet in width, and wash-dirt 3 feet in thickness, and yielding at a low estimate 5 dwts. per ton ; every 100 feet lineal measurement of that gutter would produce 60,000 cubic feet of wash-dirt, or say 2,500 loads allowing 24 cubic feet to a load,—which would yield, at 5 dwts., 625 ozs. per 100 feet, or (say) in money, £2,500. Now, as I have ample experience in this class of work, I am in a position to state that wash-dirt from alluvial leads much deeper than the one in question, and attended with more difficulty, can be worked at the rate of 10s. per load, which would include every item of expenditure in the manipulation of wash-dirt by steam puddling machines, &c. It would be a very easy matter to employ thirty or forty men, almost immediately when a shaft was down on a lead of that width ; (say) thirty men's labour would be able to produce 360 loads per week, producing in money, after paying 10s. per ton for working expenses, £180 clear profit per week. I would here remind you that I do not make these calculations by guess-work, but I draw my deductions from the fact that I have worked hundreds of thousands of tons of wash-dirt from the deep leads of Ballarat, at considerably less expense than 10s. per load ; I therefore cannot see any reason to prevent it being done in the deep leads of this Colony.

I have frequently found that the deep leads, in some parts of the sister Colony, contain wash-dirt "including both banks" to the width of 1,400 feet ; and it must be remembered, the further the leads are followed in flat country the deeper they get, thus affording greater chances for the accumulation of larger deposits on their banks. The leads in your district have already proved the existence of reef-wash deposits, and I have not the shadow of a doubt that if vigorous mining were carried on in that quarter, great deposits of valuable wash-dirt of hundreds of feet in width would be discovered on the banks of the ancient valleys ; I feel it my duty to point out the importance of putting more vigour into the working of our alluvial gold mines, and I do so from real conviction that the auriferous wealth of the Colony lies so far rather in alluvial than in quartz. If a tithe of the money expended in what is called quartz mines had been spent in the alluvial flats of Forbes, M'Guiggan's, Gulgong, Lambing Flat, and other places, the gold mining industry of the Colony would have shown greater results ; but strange to say, almost every shilling that has been expended by our Sydney merchants in mining has been directed to quartz veins, which in many cases, to my own knowledge, have not the remotest chance of recouping shareholders for their outlay. I may say that in almost every instance, all over the world, alluvial gold leads the way to fortunes in quartz mining. The Sandhurst great quartz district of the present day, was once one if not the greatest alluvial gold-field in Australia —what, I may ask, brought about such great discovery of quartz subsequently? The answer is clear and simple : the alluvial miners of old Bendigo persevered for years in clearing the subsoil for the sake of the gold it contained, and laid bare here and there the Silurian rock beneath ; as the stripping took place, outcrops of quartz veins were discovered, which are to day worked to great profit in that district. But suppose that no alluvial mining had preceded, almost all the great quartz lodes would still be remaining in secret entombed beneath the subsoil. The Ballarat alluvial mining brought about a like result. That great gold-field was almost exclusively alluvial diggings in the days of its greatest prosperity; it is now however, gradually, as the miners pick lays bare the quartzose rocks underneath the trap rock, seeking the wash in the subterranean leads, being transformed into a great quartz producing gold-field. Not one gold bearing vein however in a hundred would have been discovered, had it not been done through the exertions of the persevering alluvial miner of former days. The same system most assuredly must be followed on the gold-fields of New South Wales; and if the same pluck and energy is applied to the deep Tertiary beds of the Lachlan Valley as was once brought to bear on the Old Gravel Pits, a great system of auriferous leads as well as abundance of reef-wash will yet be discovered in your district, and, depend upon it, you cannot expect to make much discovery in the shape of valuable quartz, unless you persistently and energetically first move the auriferous soil from the face of the rocks beneath your leads, so that you may be able to examine the slate formation as well as the greenstone dike rocks for their quartz veins.

Fresh energy must be applied to the alluvial diggings of this Colony, and as soon as such a change is brought about, it will be the means of making valuable discoveries of auriferous quartz. Strange to say, just at the time when the alluvial diggings of Parkes were discovered, the great mania in quartz speculations was at its highest pitch of excitement; nevertheless, none of the public companies that were formed in Sydney ever spent a shilling on the alluvial holdings, but it is well-known that a number of valueless quartz companies were floated in that district that had not the shadow of a chance of ever paying a dividend—but what was the result as regards the alluvial of the same district? The latter class of mining produced at the rate of from six to eight thousand ounces of gold per month for nearly four years, and afforded immense profit to the individual miner without the outlay of any capital worth mentioning. One little alluvial claim designated the Welshman's, on the Wapping Butcher, produced 3,306 loads of wash-dirt, yielding 6,912 oz. 12 dwts. 2 grs., or an average of over 2 oz. per load. The expense attached to the working of this claim, including capital to commence operation, is estimated at 10s. per load or about £1,600, thus leaving a clear profit to six shareholders of £19,000, but all the quartz companies that were floated in the district, at about £180,000, only paid about £7,000 dividend, and that mostly out of subscribed capital. Yet, by some mysterious agency, the capitalists will insist upon speculating in what I call phantom quartz mines. Similar instances might be quoted in almost every part of the Colony.

We hear a great deal through the papers and other channels of the value of the deep quartz mines of Adelong; but we know as a matter of fact that one little alluvial claim on the Adelong Creek, which employs about fifty miners, has paid more dividends for the last two years than all the quartz claims in that district put together; yet we do not hear a word in the Press of this class of successful mining.

It must be considered however that I am not one of those who repudiate or disbelieve in the existence of payable quartz reefs; on the contrary, I am quite aware that the Colony is strewn from Cape Howe to the Queensland border with gold-bearing quartz reefs, a great many of which would pay dividends if worked with care and proper economy; but I do say that mythical quartz claims have been launched, the result of which has been ruinous to many who have invested in them, and it would have been no doubt much better, both for the interest and reputation of gold mining in New South Wales, had some of the capital so squandered on obscure quartz veins been invested on the most promising deep alluvial leads known to exist in so many places in the Colony.

Before closing my remarks, it is as well that I should again call your attention to the fact that my estimation of 5 dwts. per load from the South Lead, at Forbes, must be considered the minimum yield ever obtained, but it is by no means to be assumed that richer wash-dirt is not to be found.

It is well known that almost every claim on the lead averaged over 1 ounce per load, and a great many as high as 10 and 20 ounces per load. The actual working of so many claims with such splendid results leads me to believe, that if the leads in your district are again worked with energy, that not only pennyweights but many ounces per load would be discovered in patches here and there in the deep ground as well as on the sides and banks of the old river-bed; but 5 dwts per load, as I have already shown, in that class of mining will pay 100 per cent. over and above working expenses.

It is quite clear to the thoughtful and experienced miner, that your district is teeming with this class of auriferous alluvial deposit which would if worked by the aid of efficient machinery be of incalculable benefit to the district, as well as being the means of discovering rich quartz lodes which are now hidden underneath the clay and drift deposits of your great plains.

I am, &c., PHILLIP DAVIES.

(*Appendix B to Mr. Warden Dalton's Report.*)

Cudgellico, 22*nd November*, 1877.

THE shaft of the Foster's Reef Gold Mining Company (Limited) is now down 170 feet, the last level having been driven at a depth of 140 feet.

In this level the quartz was in some places 12 feet in thickness, but the gold-bearing stone only averaged about 18 inches and consisted of two shoots each about 30 feet in length. This stone has a strike north of 45°, and in underlie is nearly perpendicular; it is well formed, having clearly defined walls, with a clay flucan on the eastern side which contains gold. The gold is coarse and the lode itself has all the appearance of permanency.

There is comparatively little known yet of the actual value of the mine, as up to the last few months it has not been paying working expenses; since that time the stone has gone about 1¼ ozs. to the ton, but even at that it will take a long time to recoup those interested, who have already expended £20,000 in cash on it. About £4,000 has been spent in the erection of machinery, which consists of a 20 horse-power horizontal engine for winding and pumping, the water being taken up through 8 inch lifts, also a 17 horse-power horizontal engine driving a battery of 12 head of 6 cwt. stampers (revolving). This machinery is all of the very best description.

The Company purpose opening the next level at a depth of 200 feet, in order to further test the value of their ground.

Outside of this ground, with the exception of a few shafts sunk and not driven, no effort has been made to trace the lode north or south, although likely country exists on either side.

Looking at the large amount of money actually expended by the Foster's Reef Gold Mining Company, in their endeavours to develop the auriferous resources of this part of the Colony, it would be a graceful as well as a just act on the part of the Government to make them a grant of £4,000 or £5,000 as a recognition of their past labours, and would infuse fresh spirit into their endeavours for the future.

Memo.—The foregoing is written by Mr. Christian, our mining manager, and is reliable.

Yours faithfully, BENJAMIN PRIOR, Legal Manager.

RETURN of Gold sent from Parkes and Forbes during the year 1877 by the Government Escort.

Date, 1877.	Parkes.			Forbes.		
	Ozs.	Dwts.	Grs.	Ozs.	Dwts.	Grs.
January	568	8	17	10	8	......
February	537	2	11	......	......	......
March	1,038	17	20	......	......	......
April	868	15	6	......	......	......
May	399	2	18	16	5	......
June	660	16	23	25	8	......
July	512	17	12	29	......	......
July	592	2	3	26	7	12
August	359	11	21	......	......	......
September	2,085	12	......	66	5	23
October	605	7	17	......	......	......
November	507	10	13	20	5	6
December	468	8	10	......	......	......

	Ozs.	dwts.	grs.
Total—Parkes	9,204	14	3
„ Forbes	193	19	17

(*Appendix C to Mr. Warden Dalton's Report.*)

Names of Leads.	Number of Claims at work.	Division.	Number of men employed.	Average depth of shaft.	Average depth of wash.	Average yield of gold.
				feet.		
Well Tried	3	M'Guiggan's Subdivision	6	42	1 ft.	5 dwts. Plenty of water in drift.
M'Guigan's (North)	5	,, ,, ...	13	60 to 100	1 ft. to 1½ ft.	4 ,,
,, (South)	2	,, ,, ...	6	109	1½ ft.	4 ,,
Tichbourne	2	,, ,, ...	4	80	1 ft. to 2½ ft.	3 ,,
Wapping Butcher	4	,, ,, ...	12	40 to 60	1 to 3 ft.	3 to 4 dwts.
Oppossum	7	Parkes Division	25	50	1½ ft.	3 dwts.
Ben Nevis	4	,,	9	85	2 ft.	2½ ,,
London (Upper)	6	,,	16	50 to 150	1 to 3 ft.	3 ,,
Reed's Gully	5	,,	11	40 to 80	1 ft.	3 ,,
No Mistake (Upper)	2	,,	6	90 to 100	1 ft.	3 ,,
,, (Lower part)	4	,,	11	60 to 100	1 ft.	4 ,,
North Lead (Bushman's)	9	,,	22	60	1½ ft.	4 ,, 6 men in Shallow Rush
Shallow Rush (Surface)	...	,,	6	...	...	...
South Lead (Bushman's)	18	,,	56	75	9 in.	5 ,,
Sardine Gully	2	,,	4	40	1½ ft.	4 ,,
Great Northern	1	,,	2	80 to 130	2 to 4 ft.	4 ,,
Welcome (Upper)	3	,,	8	70	1 ft.	4 ,,
Welcome (Main)	11	,,	32	100	1 ft.	5 ,,
Nibbler's	3	,,	5	15 to 30	4 in.	3 to 10 dwts.
Tearaway, also called the Terrace	Deserted.	,,	...	...	...	...
Frenchman's	5	,,	10 surface	6 to 15	2 to 3 ft.	3 to 6 ,,
Richardson	6	,,	14	40 to 60	2	4 dwts. Water in drift.
Victoria	7	M'Guiggan's Subdivision	11	14	6 in. to 1½	3 ,,
REEFS.						
Bushman's Reef	2	Parkes Division	8	150 to 160	9 in. breadth of reef	18 dwts. per ton.
Bonnie Dundee	2	,,	8	160 to 175	....	11 to 15 dwts.
Total	113		305			

MEMO.—T. Mitchell crushed, 1877, at Welcome engine, Bonnie Dundee, 206 tons stone, average 5 dwts. 14 grs.; 26 tons stone Buchanan's engine,—so Thos. Mitchell reports to me, 14th Feby., 1878.—F.D.,W.

LACHLAN DISTRICT—YOUNG DIVISION.

(*Mr. Warden Robinson, Young.*)

I HAD the honor, in my Report for 1875, to state that mining operations in the Young Division of the Lachlan Gold Mining District did not differ from that of the preceding year, 1874; but that indications were clearly discernable of capital being forthcoming to enter into legitimate mining ventures. These expectations, however, have not been realized. My next annual report, for 1876, exhibited no new feature or change in the direction of prosperity; on the contrary, I pointed out, "that mining on the old Lambing Flat was a thing of the past." The same remark is equally applicable at the present moment.

The mining population of Young may be fairly described as miners in name only, they having long ago betaken themselves to other occupations. For making a similar statement—of absolute fact—in my last report I was severely taken to task, for which I have to express my regret, inasmuch as the assertion was put in a very general sense, and was not aimed at particular persons. I merely sought, in the discharge of my public duties, to warn capitalists residing outside the district against being led into speculations which might probably, in a short time, present a very unsatisfactory *Balance Sheet*, in the shape of "Capital Account" *nil*, and a *clean* sheet on the side of "Dividend." During the year 1877 the yield of gold for the whole district amounts to 736 ozs., as against 1,020 for the previous year, which goes far to prove that gold mining, in this division, has become very nearly a dead letter. It is true that the seasons have been unpropitious, yet, had it been otherwise, we have only the casual digger, and very few of that class, to take advantage of more favourable times; the fact is, we want an infusion of new blood before any reaction in gold-mining can reasonably be anticipated—as both capital and labour are fully absorbed in other more profitable enterprises. I repeat, that there must be a superabundance of both capital and labour before we can hope for better times in connection with gold mining. At present, agricultural, commercial, and pastoral interests command preferentially the labour and money markets. It is a fact no less singular than true, that the stir and storm recently raised here about the alleged wholesale alienation of auriferous lands are got up by parties—a few improvidents excepted—who have themselves been the most active in acquiring freeholds on the diggings. The cause of all this ridiculous sound that has been made is the mere trumpeting of envy and jealousies among themselves. These persons may rest in perfect contentment, that under the present law and regulations not one inch of auriferous land will be alienated. I shall consult the geological chart, and determine each case according to my own judgment and not otherwise. I do not, nor cannot hope to steer clear of difficulties in the office of Wardenship. Scarcely a day intervenes between disputes being brought before me relating to land alienations. This is the bugbear universal throughout this Young Division. I have had only one mining case, properly so called, to deal with during the year; and although I am called upon to travel much in the country, I have seen but two persons engaged in mining for a period extending extending considerably over twelve months. From the foregoing facts I conclude that there must be many circles described by the wheel of fortune before it comes to the turn of Lambing Flat Gold Field to command outside capital and labour. Other places, and other interests, more attractive will, as a natural consequence, have first to be satisfied. I venture to predict that, long before this foreshadowed day arrives, Young will have become—*but not from gold-mining*—one of the most prosperous districts of this Colony.

There is ample room for successful mining operations being prosecuted at Wombat when water is obtainable. The land also about Rock Ponds, near Murrumburrah, is said to be remuneratively auriferous; but there are no persons there, save, perhaps, one or two, who even lay claim to the designation "miner."

During the past year 253 miners' rights have been issued from this office. These were distributed over every section of the community—clergymen alone excepted.

SOUTHERN DISTRICT.

(*Mr. Warden De Boos, Braidwood.*)

IN furnishing my report on the Southern Mining District for the year 1877, I cannot but regret that it will be found as little encouraging as was that for the year which preceded it. The small and precarious rainfall, the long continuance of heat and drought, and the prevalence of strong parching winds have been all but fatal to mining industry, in so far as the alluvial workings are concerned. Streams of water that should have continued running until after Christmas were almost dried up in the early spring by the hurricane of westerly wind that came down upon us and continued its devastations for nearly a week, uprooting and tearing limbs off trees, unroofing houses, and worse than all for the miner, parching the earth and licking up even the small amount of water that the few preceding days of rain had given us. As a consequence, the races are now almost everywhere dry, or if there be water in any, it is but a thin trickling stream perfectly useless for profitable sluicing work. As a result of this state of affairs, mining matters throughout the whole of the district are exceedingly dull. Not being able to find profitable employment on the gold-fields, a large proportion of the miners have scattered in all directions, some to take work on the farms of the coast districts, some as navvies on the various railway extensions, some as workmen on the roads, and others for any employment that offers them a fair wage for their labour. Never before have things been at so low an ebb on the gold-fields of this district, nor, I am sorry to say, are they likely to mend until the seasons shall change and we shall once again enter upon a cycle of rain and flood years. Many of the miners, hoping as it would almost seem against hope, still linger upon some favourite field, on which they have lived for years, and from which they firmly expect to wash out the golden fortune which still year by year eludes them. How some of these manage to exist is a mystery only known to themselves. Working from daylight till dark through these long summer days for possibly a few grains of gold laboriously washed out from old tailings wherever the smallest amount of water is available, is about the extent of alluvial mining now going on amongst them. Some I know, who, having a little means, have collected heaps of wash dirt, carting and storing it in anticipation of the water by which the gold that is known to lie hidden in it is alone obtainable. This waiting, however, has gone on for months upon months, until at last funds have run out and further collection has been stopped.

Looking at the district generally, mining prospects are anything but encouraging, nor are they likely to be brighter until we once more have a succession of pluvial years; and yet, in face of all discouragements, it is astonishing to find how highly the Southern Mining District ranks in the opinion of old and experienced miners. In spite of everything, miners on the smallest inducement, will push out in all directions through it, in the hope of finding some auriferous deposit which shall be as rich as those which have preceded it.

In several directions new ground has been struck by these prospectors, and I have every reason to believe that if we had a season or two of more favourable weather, payable ground would be opened in more than one part of the district.

First in order of date amongst these new workings—if indeed they may be so called—are some alluvial patches which have been struck upon the old Mogo Gold Field, in the vicinity of the the Clyde River. I mentioned in my last Annual Report, that one or two such patches had been opened out; and since then other small areas have been hit upon. They have not been extensive, and have served only to give employment to some half a dozen men for as many weeks; at the same time they have had the effect of proving that this field is by no means worked out, but that if carefully prospected there are many places yet remaining that would give a good return for labour. This opinion is held by others, for only a few weeks back a party of men took up a lease of alluvial ground here with the intention of bringing a race on it and working the whole away by ground sluicing. As a matter of fact, very little of the Mogo ground has been systematically worked. As I have already explained in one of my former reports, the style of work has been anything but regular mining. On the flats the holes have been sunk in the rough hasty careless way that is characteristic of a new rush, and the ground has never been touched since. On the hill-sides the run of gold is first struck either by a shaft or on the surface, and then is followed into the hill until the wash is lost. Hereupon the miner leaves the spot and prospects about for another run. Then again, the wash-dirt being taken down in bags to the creek to be washed out, it must be evident that the whole proceeding was a great waste of labour as well as of washing material, and was very far from what an old sluicer would call "working." Should the party who are now preparing to go to work be successful, there is every probability that other ground will be taken up for sluicing purposes.

The country has a promising look for gold, consisting as it does of heavy schistose ranges, occasionally opening out upon the creeks and water-courses into alluvial flats of greater or less extent. Wide jagged reefs of sandstone cross here and there, intersected with veins of quartz from 1 inch to 2 feet in thickness. This character of country prevails all the way up the Clyde River and also up the Currawan Creek, until the granite outcrop is reached, high up towards the source of that creek on the eastern slope of the Buddawang mountain. Almost everywhere along the course of this river and creek, in every little gully and water-course that runs into them for some 100 yards or so below the veins of quartz that seam the ridges, gold is to be obtained, being in these instances the deposits left by the cutting through and breaking up of the softer parts of the reef by the waters which have forced a passage through them. Such was the so-called discovery reported to me in October last. The locality was a small dry watercourse, and the gold was found about 50 yards below a reef which had been broken through by the waters of rainy seasons. This reef is about 2 feet wide and has been traced by the outcrop, as I was informed, for a distance of 2 miles.

Whilst on the subject of this gold-field, I may as well state that though a large number of claims were taken up and leases applied for on the Mogo Reefs, every one of the claims has been abandoned, and not one of the leases has been taken up. So long as the slate walls continued soft, which was for a depth of 40 or 50 feet, so long quartz was raised; but when the walls hardened, and the labour of raising the stone became expensive, the work was discontinued. That these reefs, which have been the matrices whence came the rich alluvial deposits of Mogo, will one day be advantageously worked, can hardly be doubted; but they can only be thus worked by men of means, who when a belt of poor stone is reached will have the capital to enable them to bear the cost of sinking through it until a payable belt of stone is reached.

The next in order of date, like that I have just mentioned, can hardly be called a new discovery, although it has had the effect of opening up a very considerable extent of new ground to mining enterprise. This was the striking upon what the miners have very appropriately termed "terraces," on the banks of the Shoalhaven River, some distance above Nerriga.

At this part of the river, the strike of the clay slates which border it is parallel with the course of the stream. The action of the water along the line of outcrop would thus be more effective, and the softer parts of the reefs have been eroded, leaving the hollow thus formed to be filled up with detritus, and afterwards covered with alluvion. The wash-dirt ranges from 6 inches to 3 feet thick, the alluvion ranging in depth from 12 to 18 feet. These terraces lie about 30 feet above the level of the present stream, and the existence of another series of them still higher up has been proved. It has been surmised that these terraces were at one time the river-bed, and that the present bed has been hollowed out since the deposit of the gold in the gutters of the terraces. This, judging from what we have seen of other rivers of the Colony, would appear the more natural solution of the matter, though it is a question that can only be solved by a careful examination of the ground and of the material of which the detritus is composed. Looking at these deposits, however, from the practical point of view, it becomes matter for inquiry whether there are not other portions of the river-bank similarly situated?—and whether, where the strike of the slates is parallel with the course of the stream, other terraces may not be discovered.

The opening of these terraces has been the means of giving employment to some forty or fifty miners; but these are scattered over a length of several miles. The character of the work entails considerable labour and expenditure in the construction of head-races for sluicing, and tail-races for carrying off the refuse tailings. To get a return for their expenditure, the miners require to take up as large a claim as the Mining Board Regulations will allow. Then again, to prevent the races of one party interfering with those of another, the men are obliged to allow each other a good amount of elbow-room, and thus it is that the claims are so scattered. Another advantage that has arisen from this discovery is, that it has again drawn attention to the series of reefs at Fernbank. Several parties have spoken to me about them; and I expect soon after the new year to have an application for an extended claim on them from a party of experienced quartz miners, who propose to give the stone a fair trial for another 40 or 50 feet.

Perhaps the most singular discovery that has been made during the year is that of the auriferous veins or leaders on the summit of Mount Dromedary. Standing as it does so close on the coast-line that its foot almost reaches the sea, attaining an elevation of over 3,000 feet above sea-level, and having the peculiar conformation that distinguishes it, it forms a well-known land mark to vessels trading on our coast. For rather more than half the ascent, the formation is schistose, the slates being much decomposed, with deposits of alluvion wherever the fall of the ground allows of its settlement. It is clothed with very heavy timber of the ordinary coast type, the gullies and water-courses running into complete jungles from the luxuriance of the undergrowth. A narrow belt of broken trap intervenes as the mountain is ascended, and then the formation changes at once to granitic, boulders of all sizes lying about in every direction, barring the way to anything but the most tortuous passage. This formation continues to the crest of the mountain, the boulders getting larger and larger as the top is neared, except here and there where small plateaux of comparatively level ground are reached. On one of these, just above where the granite formation commences, a conditional purchase has been taken up, and here is one of the finest waterfalls that I have seen in the country. Just at the back of the selector's homestead a vast solid wall of granite rises up sheer and perpendicular to a height of some 300 feet. Over this, a fine stream of water, one of the heads of the Punkalla Creek, throws itself with an angry roar, is divided almost into spray before it reaches the rock below, and then battling its way grumbling amongst the boulders travels to the country below.

About 500 yards from the highest crest of the mountain, and just at the foot of the last and steepest rise on it, these veins were discovered. They were struck by the Messrs. Cowdry whilst following up one of the streams that run down every gorge and gully of the mountain. The mode of working was to sluice the bed of the gully down to the rock, washing the dirt in sluice-boxes, into which the water was turned. Besides the bed of the gully, a good portion of the alluvial deposit on either side of it was also put through the sluice-boxes; and in cutting down the western bank of this water-course a small vein of comminuted quartz was met with, showing gold very thickly distributed amongst the stony particles. This vein was followed into the hill, others were encountered, and as the ground was opened it was found to be perfectly seamed with veins of a similar character.

The veins are found in a granitic diluvium, having no walls, in the ordinary acceptation of the word, but being cased above and below in a narrow coating of fine white pipeclay, ranging from one-eighth to nearly half an inch in thickness. The veins, though contained in this granitic sand, appear to have been crushed up and comminuted by some very powerful pressure—so small are the pieces into which the quartz has been broken. They have also been very full of sulphurets, which have long ago decomposed leaving the gold free and visible between and adhering to the fragments of quartz, so that it is easily collected in the sluice-box. On my last visit I was enabled to form some estimate of the yield. I calculate that the Messrs. Cowdry have washed away about 24 cubic yards of stuff, and from this they have won gold that they have sold for £120, thus giving a return of £5 each cubic yard that has been sluiced. The vein-stuff was picked out and washed separately, the remaining alluvion being ground-sluiced with a return of 5 ounces of gold. The quantity of earth washed by the prospectors in two months would have been removed by some of the old sluicers of Araluen or Major's Creek in a couple of days, especially with the good stream of water—a strong ground sluice-head—which has been brought on to the spot. A party of three have taken up a claim about 50 yards from the prospectors, and are working it by means of an adit or tunnel, wheeling out the vein stuff and box-sluicing it. They have hardly yet got their ground fairly opened, and yet they are obtaining satisfactory returns. These are the only parties at work, though, as I stated in my report to you some months back, I believe the whole crest of the hill to be seamed with these veins, and that remunerative employment could be found here for a couple of hundred miners.

Apart from the mountain itself, every water-course that descends from it has been proved to be auriferous. Punkalla Creek and the Dromedary Creek have been worked profitably for the last seventeen or eighteen years, the miners gradually working their way upwards. Reedy Creek has been prospected and worked in places, but never systematically. Dignam's Creek is known to be auriferous, though it has never been properly tried. Owing to the large amount of underground water, shafts cannot be bottomed, or paddocks taken out, without a large outlay, either for pumping or bringing up a drainage race. As I have already reported to you fully on this part of the country, it will be needless for me to say more here than that after examination I conceived so high an opinion of the ground that I recommended its proclamation as a goldfield.

In July last I was shown by Mr. Shanahan, of Molonglo, a very pretty sample of gold that had been found on his private property at Long Swamp. On the first occasion that offered I visited the spot, for though the discovery had been made on alienated land, I considered that it might tend to render available Crown Land in the vicinity. A shaft about 14 feet deep had been sunk on a small flat on the bank of a creek running into the Mulloon, or Long Swamp Creek, at the back of the homestead. The party who sank the hole, Mr. Shanahan and one of his employees, were not miners, so that when the underground water came in on them they were not in a position to keep it down, and were thus able to get up only a small portion of wash-dirt. From this, scooped up hap-hazard through the water, and which did not much more than half fill the dish, about half a pennyweight of gold was washed out. The creek is here surrounded by limestone ridges, through a bar of which stone the water has cut its way. It is above this bar the gold was found. The limestone is a very hard silicate of lime, very closely approximating in appearance to the common blue-gray marble. At the mouth of the creek the ridges are schistose, the slate and lime formations coming abruptly into contact about half a mile from the swamp. Altogether the country has a promising look. Mr. Shanahan has made a very liberal offer to any party of experienced miners who will undertake to test the ground, and I have every reason to believe that it will be fairly tried after the Christmas holidays.

Warri is likely to be again tested. A party has taken up four men's ground, with the intention of putting down two or three shafts, and driving across the line of the supposed underground gutter. Two men of this party were at work here two years back, when Lowe's party sank their prospecting shafts with such small results. Owing to an accident to one of their mates the party broke up without bottoming the shaft they were sinking, and this shaft they now propose to commence with.

With regard to the old fields of the district, there is but little encouraging to report. Beginning at Araluen, one new claim has been opened here by Johnson and party, on the spot near Bourke Town alluded to in my last yearly report. Here the floods have done about half the stripping which previously would have been required to work the ground. The Valley of Araluen consists of a deposit of alluvion some four or five and twenty feet in depth. From about 12 to 18 inches of the surface, the soil is composed of fine light sand, largely mixed with decomposed vegetable matter, and forming very good cultivation ground. Below that lie layers of sharp, raw-water, washed sand, of different colours, marking the different eras at which they have been deposited, the various strata that have been cut away by the water, and the extent of the floods which have brought them down. These lie to a depth of about 16 feet. Then comes a stratum of heavy boulders and mud from 3 to 4 feet deep; and below this again, to the bed-rock, lie the wash-dirt and sometimes another layer of mingled sand and detritus. As the superincumbent soil is of so light and friable a character, and as the stratum of boulders carries a very heavy under-current of water, it has been found impossible to work out the wash-dirt by means of shafts and drives, as is done in the close and compact soil of other gold-fields. Thus, the whole of the overlying sand, mud, boulders, &c., down to the wash-dirt, have to be carted away or "stripped" as it is termed, being drawn out by carts (in the case of Blatchford's claim, by tramway) and thrown on to what are termed "tips," from a "tip-cart," being used for the purpose. The work is commenced by bringing up a tail or drainage race at such a level as to drain off the water from the bottom of the ground sought to be worked. This done, a paddock is opened, the soil down to the wash-dirt is carted off, and the wash-dirt is passed through sluice-boxes supplied with water from a head-race which also has to be brought on to the ground. As the ground is worked, the tail-race is carried higher and higher up the creek, being carefully timbered, covered in, and protected, so that the tips can be emptied on to it. Provision has also to be made for keeping floods out of the open paddocks of the claim; and this is done by the construction of extensive dams, which turn the water off the claim and confine it to a regular channel. Some of these are extensive works—the banks, in places where flood waters run the swiftest, being faced with planking in order to prevent their being cut away by the force of the currents.

It will thus be seen that a great deal of expense has to be incurred before washing can be commenced, and anything of a return be obtained; and it is not wonderful that men of limited means should hesitate before such an undertaking. In the case of Johnson's Claim, opened last January, an expense of something like £1,500 has been incurred, and it is only within the last week or two that it has begun to wash. As the washing goes on, the stripping and carting away ahead still goes on with it; so that even when a paddock is opened and returns are coming in, the expenses are still heavy, and will run up to something like £60 or £80 a week. Merely to pay these expenses, a return of at least 20 ozs. of gold per week is required, but if a piece of payable new ground is hit upon, this quantity may be obtained in a single shift. And this reminds me that I should mention that these claims are worked continuously day and night by shifts of men. From 3 ozs. to 4 ozs. per diem will just about pay expenses, and if anything more is obtained it goes towards a dividend. So much of the ground, however, has been worked over, that it is but seldom that a piece of solid (unworked) ground is met with, and when it is, it is often unprofitable, from its being ground that the miners of former days have left on account of its poverty. Very often, however, a good thing is made out of the old ground, for in the palmy days of Araluen, when claim-holders were getting 50 ozs. and 60 ozs. to the double shift, and wages were 70s. per week, labourers were less careful than they are now-a-days, employers were less watchful of their interests and appliances were less perfect than they are at present, consequently much of the finer gold was allowed to escape out of the sluice-boxes, and lies in the creek to be picked up now and again by the workmanlike manipulation that the wash-dirt now receives. This has been more especially shown in Newman's Claim, at Crown Flat, where for some time they were putting through their sluice-boxes old tailings, from which they were getting from 50 ozs. to 60 ozs. per week.

I have gone thus lengthily into the matter, for the purpose of showing the difficulties which stand in the way of a more extensive working of the Araluen Valley. Most of those who have made money here have long since departed to spend it elsewhere; and those who remain are chiefly working miners without capital enough to go into such extensive work as is required. Capital from outside is hard to be obtained, nor is it likely to flow in to any extent until time shall have restored some of the confidence that the mining mania of 1872 so completely destroyed. That there is here a good field for investment of capital, I have little doubt; the present creek-bed is not the only channel through which the water has always run. There remains then some old creek-bed to be opened; and that such exists is partly proved by the different character of the gold obtained in Upper Araluen, in Araluen proper, and on Crown Flat, the latter especially showing a very marked change. However, with capital confidence will be required, as it may happen that twelve or eighteen months will have to go over with constant payments before any even the smallest return can be expected.

In writing this, I have been alluding to the Araluen Valley proper, for below Crown Flat the work is not on so extensive a scale. There is less stripping, the hills on either side come down closer together, and the flats are more narrowed in. The soil is of a different character, principally decomposed clay slate, and there is not the same amount of underground water. For these reasons it can be worked in smaller parties. This is done on the co-operative principle, from six to a dozen men joining together to find money, horses and carts, or labour, the work being carried on as above described by stripping, the water being raised by a water-wheel working a Californian pump.

At Upper Araluen the claims are ordinary ground-sluicing claims, requiring no especial or particular notice.

The Major's Creek alluvial workings require a flood to make them payable. The ground is so poor that it will not pay for removal in any other way than with water, and as there are in many places some four or five and twenty feet of top-soil to be washed away, it will easily be understood that this can only be done by a strong head of water. There are no permanent creeks or streams available for bringing on to the ground, with the exception of Deep Creek, and the water from this is taken up, being only sufficient for the supply of one, the first water-right holder. The only supply therefore that is obtainable, is from reservoirs formed with catch-drains leading into them, by which water is obtainable in wet seasons only. A flood is consequently looked upon with complacency, as the devastations it commits upon the soil are precisely the work which the miner requires from it. Wanting the flood, or at all events a copious rainfall, the Elrington miner is at a stand-still. During the past year there has been nothing that could be called a flood in the district, nor has there been such a rainfall as to give more at any one time than a week's work. The produce of alluvial gold has therefore been comparatively less than last year.

Reefing, however, took a start for a few months, and the striking of some rich patches on Mobbs's Line, just within the boundary of Hassall and Roberts's private land that joins the Elrington township reserve, gave the miners some little temporary encouragement. But the veins were only narrow, some 2 inches to 4 inches wide were very patchy and after a time gave stone that barely paid for the raising. A few men are still at work on the line, but I have not lately heard of any particularly good returns. The average yield of these veins, taking the whole lot crushed, will not give more than an ounce and a half to the ton, and this yield for a leader from 2 inches to 4 inches wide can hardly be said to be highly remunerative.

Preparations are making for working Field's lease on the Big Hill. A newly patented rotatory furnace is to be employed for roasting the crushed and reduced ore, the company intending to save nothing but the gold. From an experiment fully carried out in Melbourne, the head quarters of the company, upon 5 tons of stone fairly taken from the heap at the shaft's mouth, the crushing and reducing process gave 20 per cent. of auriferous pyrites; and these pyrites after roasting gave a return of 9 ozs. gold per ton, or, in other words, the 5 tons of ore gave 9 ozs. gold, all the other metals contained in it—silver, galena, copper, zinc, cobalt, &c.—being dispersed in fume. All this information has been already given to you by me in another form; and you have on record in your office a very full report on these mines, so that it would be useless for me to go again over the same ground.

Dargin's Reef, on Spring Creek, and within Messrs. Hassall and Roberts's boundary, has been doing very well of late, and the shareholders have been receiving good dividends for the last three or four months. This is the micacious stone of which I have sent you down many samples, and on which I have previously reported to you very fully. The quarry, for such it really is, being 40 feet wide, is being worked by a co-operative party, each miner having a direct interest in the ground and working to represent it. Under such circumstances it is satisfactory to know that they are getting remunerative employment for their labour.

The Bell's Creek Reefs on alienated ground are being worked spasmodically with varying results. Sometimes a patch of good stone is struck, and this leads others to go in for a time for similar luck, but except in the case of Mr. Quong Part, and of one or two others, there is no regular work doing on the reefs. The veins are narrow, running about 4 inches wide, and though sometimes rich the average yield will not be over 1½ oz., so that as soon as the wall-rock becomes hard, the miner, without capital to back him, cannot keep on work on the mere chance of hitting rich stone. He has probably a wife and children to support, and must have the weekly wherewithal to buy food for them. When the stone gets poor he leaves for some more certain spot; but so much confidence has he in the reefs, that as soon as he makes a rise of a few pounds he is at them again, only to leave them once more when his cash is exhausted, unless he have the luck to strike a rich patch.

In alluvial work Mr. Quong Part has a very extensive flooding off and sluicing claim. He has brought the tail-race of the old American party up to a hill just below Mr. Forsyth's stamping battery. This hill, which was some 120 feet above the level of the creek, has now been nearly all sluiced away by water brought by a race from the head of Sheep Station Creek. The work is not only an extensive, but has also been a very troublesome one, owing to the way in which the ground had been previously worked and cut up; and the way in which it has been carried out reflects great credit on Mr. Part's management and skill. As the ground was very rich when first worked by shafts and tunnels, and as it was but very imperfectly worked, a good return is expected for the great labour expended and large outlay incurred.

Little River is more than usually dull, owing to the want of water to fill the races. For the last three years the supply in the races has been so intermittent that miners have got discouraged, have in some cases sold for small sums out of races that cost hundreds of pounds, and have either left the river or are preparing to do so. With more favourable seasons, however, the probability is that the mining population will once more come back to its old standard. On the river itself there are some bank claims at work, but so much of these banks has been worked that it is only just here and there that the miner is lucky enough to hit upon a good payable patch. Back from the river, little or nothing is doing; and there are parties who to my knowledge have been carting and storing wash-dirt for the last two years, and who during that time have never had sufficient water to wash up with, and there the bulk of it now lies waiting for a really rainy season to separate the valuable from the valueless particles. Miners however must live, wives and children must be fed, and to do these work must be carried on early and late, fossicking in promising localities, carting wash-dirt down to the river to sluice, or adopting some other equally laborious or expensive way of raising even a few pennyweights to pay expenses. There is no chance of the revival of alluvial digging on this field until we have another succession of wet seasons; and it really shows the persevering energy of the miners that so much gold has been won here in the face of such depressing circumstances.

The reefs of Little River still remain idle and unworked, although there is a probability of something being done here before long, as there are two contending claims to the line known as the Red White and Blue, and either party that may obtain the lease will be prepared to push on the work; with reefs as promising as any in the Colony, which have already given such good returns, and which are situated in the midst of a highly auriferous country, it seems

RETURN of Gold purchased by the Banks and others

	Little River.	Major's Creek.	Jembaicumbene.	Shoalhaven.	Bell's Creek.	Araluen.	Mogo.
1877.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.
January	235 7 19	178 3 11	19 7 6	5 3 10	28 4 15	....	....
February	180 14 4	114 6 12	20 4 1	1 3 0	2 1 10	....	....
March	205 10 12	138 0 3	22 13 0	2 1 7	57 13 16	1 12 14	....
April	239 13 2	219 16 14	12 6 1	41 19 13	53 3 18	....	....
May	69 4 3	321 3 17	29 1 0	23 11 11	....	....	....
June	172 6 0	199 2 15	10 17 5	17 15 21	20 5 0	....	2 1 14
July	145 2 9	251 3 3	20 7 0	3 5 13	....	....	....
August	153 0 23	267 2 21	3 8 11	40 5 19	81 1 11	....	2 15 0
September	254 18 3	304 3 12	22 4 17	1 11 0	26 0 12	....	....
October	174 16 16	231 4 16	6 14 2	15 4 3	....	....	....
November	165 14 19	355 2 6	3 1 19	10 13 18	10 14 18	....	....
December	190 9 17	320 13 6	11 15 6	19 6 0	30 13 0	....	....
Lump sums for the year	....	....	100 0 0	....	120 0 0	4,282 0 0	161 0 5
Total	2,186 18 7	2,900 2 16	281 19 20	182 0 19	429 18 4	4,283 12 14	165 16 19

strange that nothing should be done to develop them. All that is required is that a commencement should be made under good intelligent management; then, should the first venture prove a success, which there is every likelihood that it will prove, there is little doubt but that the whole line of country will again be taken up and worked.

With respect to the Nerrigundah Gold Field, a very few words will suffice. It has gradually fallen off during the last two years to such an extent as to have become all but deserted. So much has this been the case, that I have not had occasion to visit the locality officially for the last twelve months. If things do not improve within the next twelve months, it may become a question whether it is worth while to go to the expense that is now entailed upon the Department by this gold-field, and whether some cheaper plan of management might not be adopted.

As the Mining Registrars of the several divisions and subdivisions of the district send in their annual reports to you direct, you will be able to obtain from them all the statistical information of the several localities in a correct form.

The return of the yield of gold during the year, as shown by the amounts purchased within the last twelve months by the Banks and others, will be found in the tabulated statement appended.

from the several localities named, during the year 1877.

Dwyer's Creek.	Dromedary.	Nerrigundah.	Tuross.	Tin Mines.	Queanbeyan.	Stoney Creek.	Sundries.	Total.
oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.
......	......	......	......	......	....	....	43 10 8	509 16 21
......	......	......	......	......	1 0 0	....	10 3 6	329 12 9
......	......	......	......	......	....	....	....	427 11 4
......	......	......	......	......	....	....	19 17 9	586 16 9
......	......	......	......	......	....	....	....	443 0 7
......	......	......	......	......	....	....	....	422 8 7
......	......	......	......	......	....	....	15 8 14	435 6 15
......	......	......	......	......	....	....	20 15 6	569 9 19
......	......	......	......	......	....	....	12 1 13	620 19 9
......	......	......	......	......	....	....	23 2 20	451 2 9
......	......	.....	......	......	....	....	17 4 18	562 12 2
......	......	......	......	......	....	....	14 5 4	587 2 9
2 10 7	25 6 7	1,055 14 18	2 7 14	2 8 21	109 3 9	0 9 12	....	5,861 0 21
2 10 7	25 6 7	1,055 14 18	2 7 14	2 8 21	110 3 9	0 9 12	176 9 2	11,805 18 21
Amount bought by Bank, not sent by escort, and not specified..................								878 13 11
Grand total....................................								12,575 8 23

CHAS. DE BOOS,
Warden, S. M. District.

TUMUT AND ADELONG DISTRICT.

(*Mr. Warden Vyner, P.M., Tumut.*)

I REGRET that my report of the progress of mining in the district under my charge should be even more unfavourable for the year 1877 than it was for that of 1876. The drought still continues with unabated severity, and I have not seen so short a supply of water here for nearly forty years past. Even the mountain streams, which used formerly to be little affected by the heat of summer, are drying up one after the other in the most unexpected manner, and the limited supply of water hardly serves to keep the sluice-boxes tight. Under these circumstances it will not be difficult for you to conceive that alluvial mining is altogether stopped, and even quartz mining is at a stand-still from the fact that there is not sufficient water to supply the motive-power for the crushing machines.

Hope amongst the miners seems to have dried up with the water, but they are doing their best to supply its place with patience.

Still, after all I have said, I believe there is a great future for mining enterprise in this Colony, for as long as gold is the standard of value, and iron, tin, and copper supply the raw material for some of our most useful manufactures, capital and ingenuity will find means to render harmless these now disastrous seasons if they cannot avert them.

TUMUT AND ADELONG DISTRICT—ALBURY DIVISION.

(*Mr. Warden Brownrigg, P.M., Albury.*)

ALTHOUGH the gold mining operations in the Albury Division of the Tumut and Adelong District may not as yet have exhibited any steady, progressive, marked results, it is nevertheless the opinion of thoroughly competent persons that from those already obtained it may be taken for granted that the district is possessed of large mineral resources only requiring the application of more capital, enterprise, and better directed labour towards their development than have hitherto been devoted to this object.

With this preliminary remark, I have now to observe, that unfavourable as was my report of the gold mining operations in this district for the year 1876, my present one for 1877 will be found of a still more discouraging character.

Adverting to what has been done on the Black Range Gold Field—which field, it may be here incidentally mentioned, has been more or less worked upon since as far back as 1852, and no inconsiderable amount of gold has been procured therefrom—referring, however, specially to the operations of 1877, I have to state that only one claim, the May Day Reef, has been worked continuously throughout the year, but as yet without any declared result in value. The work has been limited and confined to merely raising stone to be presently crushed at a small machine recently erected on the spot, but which cannot be set in motion until an adequate supply of water is obtainable. The very dry season that is being passed through has cut off the supply that was anticipated would be available.

The quantity of stone now at grass ready for crushing has been too vaguely stated to be reliable. Last year the stone from this claim was sent to Chiltern (25 miles distant) to be crushed, but owing to the serious expense attending this procedure it is discontinued, of course, in favour of the local machine, the erection of which is encouraging several parties to take up and give another trial to some abandoned ground. These operations, however, are suspended awaiting a supply of water.

At the close of the year there were only fifteen miners at work on the Black Range.

The several gold mining leases applied for in 1872 and subsequent years, have, with the exception of two, all lapsed.

Passing to the Yarrara Gold Field, I am unable to report any improvement there; on the contrary, rather a decline in its prospects.

The Perseverance Company's claim is the only one that has been worked to any extent during the last twelve months.

The mining manager of this company has furnished me with the following particulars:—The engine shaft is now sunk to the depth of 200 feet (an increase of 60 feet since last year), a cross-cut of 15 feet in length has been opened to strike the reef. The length of the bottom level is 100 feet east and 38 feet west of the shaft. The quantity of stone raised is about 320 tons, which yielded 161 ozs. 15 dwts. 6 grs. of gold. The reef is variable, running from 1 inch to 3 feet in thickness.

On the Fidelity Lease, on the same line as the Perseverance Reef, and held by the same company, another shaft has been sunk to the depth of 110 feet, from which 819 tons of stone have been taken out, and gave a yield of 77 ozs. The work, however, has been discontinued, it being found necessary to raise additional capital to carry on the sinking. Improved results are expected as the shaft goes down.

On a comparison of the results of operations at the Perseverance Claim during the year 1876 and 1877, respectively, a great decrease is apparent:—

1876.	Stone raised,	800 tons,	yielded	1,211 ounces of gold.
1877.	„	320 „	„	162 „ „
Decrease		480		1,049

The stone raised from the Fidelity Claim, which produced 77 ounces of gold, is not included in the above.

With regard to the Just-in-Time Reef, Mr. Armstrong, the Warden's Clerk and Mining Registrar of the Yarrara Gold Field, reports as follows:—

"A vigorous attempt was made during the Spring to turn the reef to account by a small party of miners who held it on tribute, but after a couple of months' work their efforts ended in failure, so far that it did not pay expenses."

Yet it would appear from a return furnished me by the proprietor of the crushing machine at Yarrara, of the yield of gold obtained from the several claims along this line of reef, that the prospects were not altogether indifferent:—

				ozs.	dwts.	grs.	
No. 1	had a crushing of	38	tons, yielded	11	7	0	gold
No. 2	„ „	40	„ „	11	11	6	„
No. 3	„ „	46	„ „	4	15	0	„
No. 2 (North)	„	21	„ „	5	5	12	„
Total		145		32	18	18	

The average depth of the respective shafts being about 40 feet.

As to the Rangaulen Reef, Mr. Armstrong states:—"This reef has also been tried a little, but without any good results." He also states, that "the Messrs. Part are now trying a reef in the neighbourhood, which they have held under lease for some time. They have nothing very good to show at present, but hope for better on the strength of the prospects already obtained. Nothing is yet known of the new reef recently found by Scott. The present population on the Yarrara Diggings does not exceed 30 persons."

In my last annual report I gave some account of the operations of the Jingellic Tin Mining Company, as furnished me by the Mining Manager of that Company, to whom I am again indebted for the following most satisfactory report of the company's work up to the present time:—

"During the past year I have paid, in wages, £1,958 12s. 2d.; other mining material, £1,140 10s. 4d.; making, together, £3,099 2s. 6d.

"Our machinery is all erected, and consists of one 25 horse-power engine, with 24 feet by 6 feet boiler, and 12 head of revolving stamps with 24 feet raddle. We have constructed a water-race from Swamp Creek, 2 miles and 30 chains, to our mill; but the season being so very dry here, we have yet no water to crush with, and I have been obliged to discharge 20 men until the rain sets in.

"Our tramroads finished and in course of construction consist of 4,627 feet of single lines of horse roads, and 2,640 feet of double line self-acting mountain road, 3 feet gauge, and rising 500 feet in its length, and carrying 3-ton trucks.

"The work done on the four lodes now opened is—length of tunnels driven 510 feet, drain 440 feet, and the sinking done in the different shafts amounts to 157 feet; and the gross amount of all stone raised at the different lodes is about 680 tons, and the total expenditure at this time to date is (£6,000) six thousand pounds.

"I am happy to say the prospects of the mine are very favourable, and, in conclusion, I may state there is a large mineral district awaits development here."

Before concluding my report, I would venture to observe that the endeavour which is being made by the Mining Department to put an end, so far as may be practicable, to what had become almost a system, viz., parties holding leases for a lengthened period without complying with the labour conditions, is duly appreciated by the mining interest in this district.

PEEL AND URALLA DISTRICT.

(*Mr. Warden Buchanan, P.M.*)

IN doing myself the honor of presenting my Annual Report on the mining industry in the district under my charge, I need hardly allude to the depression which has manifested itself generally in nearly every other branch during the past year, owing to the severe drought under the baneful effects of which the Colony has been suffering.

2. The peculiarity of mining renders the pursuit specially liable to feel the effects of commercial stagnation, particularly in its present condition, seeing that operations are mainly confined to the working of established fields; and the process employed requiring more capital and expensive appliances than at a period when the industry was virtually in its infancy, it is not now so much a question of energy and enterprise on the part of the practical miner as upon that of the capitalist, and the doubt and uncertainty which pervade all commercial circles owing to the disastrous drought have been particularly felt in that of mining.

3. That confidence in the prospect of ultimately, with profitable results, developing the mineral resources of the Northern District is not by any means shaken, has been very significantly brought under my notice by the exhibition of jealousy with which leaseholders have guarded their rights and vigorously repelled encroachments in cases where my official adjudication has been required. For although in many of these it may be remarked that no active steps have been taken by leaseholders to work the ground other than the regulations imperatively demand, still they have spared no expense, legal and otherwise, to defend their claims from alienation, when attempts have been made to obtain it upon the presumption that the regulations have not been complied with.

4. My official duties in conducting the inquiries in my Courts into the position of the contending parties, have naturally given me more opportunities of noticing the spirit of competition evinced by litigants than the reading of depositions would disclose; and I can plainly see that, so far from mining enterprise being paralysed, it is simply checked by circumstances, and only needs the latter to take a more favourable turn to effect active development.

5. The cancellation of numbers of leases has unquestionally led to practical benefit. Enterprising men, satisfied with the prospect of profitably working many of the reefs, have not considered it advisable to embark in large undertakings unless they had greater areas, inasmuch as what they might do would really benefit a large number of impecunious persons who had possessed themselves of small adjoining claims, and simply held on to them to take advantage of the enterprise of other people, and to use an ordinary phrase "job" them in the market. Many of the leases of this latter class of persons have now been forfeited, and if the claims have not fallen into the hands of the former they are in a fair way for so doing, and I look confidently forward to a more hopeful state of things hereafter.

6. In pursuance of the ordinary method adopted in the draft of my annual reports, I subdivide as follows:—

Gold.

7. As far as the working of the reefs in this district is concerned, I have but little to say, as no animation has been noticeable except in the Walcha Reefs, better known as Glen Morrison; a crushing took place of 50 tons some time ago which realized 716 ozs., or an average of about 14½ ozs. to the ton, and the claim-holders have now 20 tons of quartz to grass which they

estimate will realize about 5 ozs. to the ton. Though these figures show plainly the richness of the reefs, it must be borne in mind that they are being but slowly developed and under circumstances of considerable difficulty. Still one share (one-eighth) in this particular claim was sold for £300, and at this price was looked upon by the purchasers as cheap. The depth of the shaft is 140 feet, and the deepest level 130 feet, the vein is 9 inches wide, the dip south.

8. There is a considerable quantity of pyrites in the stone, but hitherto this has been saved for the purpose of further treatment, and no estimate can be given of its value. Some time ago Mr. Keogh, representing a company of Melbourne gentlemen, applied for a lease of 25 acres on this field, and within the area of the proposed lease were many abandoned claims; unfortunately a hitch has arisen, and at present the granting of the lease is in abeyance. I regret that this delay should have arisen, as a far more vigorous attempt to develope this field was on the verge of being carried out. The company, however, having every prospect of their application being successful, are manfully at work and have already sunk a shaft 70 feet in depth. I may remark in concluding this notice of Glen Morrison, that one of the most experienced mining managers at Bendigo has thoroughly inspected the locality, and the formation of the country assimilates so much to that of Bendigo that he speaks in the most confident terms of its probable success as a gold-field.

9. The subdivision of my district under the present Act has considerably curtailed my supervision of the alluvial areas, and I can only speak with any degree of interest respecting the Rocky River Field, as otherwise what is being done is of a very trivial character and mainly effected by small parties of Chinese working the banks of rivers. The old Oban Gold Field is all but abandoned, and at Puddledock a few sluicing claims are at work at intervals, but the proprietors simply combine mining with agricultural pursuits. The results, be what they may, seem to be satisfactory to themselves.

10. At the Rocky River, however, much enterprise is being displayed, but the fruits are not yet apparent. Nearly all the gold-mining operations here are carried out under the sluicing system, and as the miners depend upon their water supply mainly from storm waters, the recent drought has seriously militated against them; I cannot perhaps better allude to the condition of this field than by drawing your attention to Appendix No. 1, kindly furnished me by Mr. Roman. The Long Tunnel Company therein referred to, I may add for your information, was formed to work a large area of ground known in the early history of the field as Sydney Flat. Very good results were obtained in several shafts sunk here; in fact some of the claims proved immensely rich. In certain claims the water beat the miners, and they were compelled to abandon the ground for want of appliances. The object of the party who now propose working this locality is to drain it by means of a tunnel driven through one of the ridges surrounding the flat, and subsequently working the auriferous stratum in the ordinary way. Seeing that the most prominent shareholders in the company are old Rocky River miners and thoroughly familiar with the ground, there is every prospect of the enterprise being singularly profitable.

11. Although I must regret that my report of the gold-fields under my supervision is not as satisfactory as I could have wished; at the same time, considering the untoward circumstances under which the enterprise is being carried on at present, I do not think it worse than it has been for the last few years. I think the peremptory cancelling of leases where conditions are unfulfilled should be more speedily executed than at present, as the leases would then possibly fall into the hands of persons who would have the energy to work them; but so long as the Mining Registrars and Bailiffs are so meagrely remunerated, I hardly see how they can be expected to take much interest in hunting up defaulters and in bringing about cancellations. The Attorney General's opinion I have lately received from your office shows how necessary it is the 123rd and 124th clauses of the Mining Act should be amended without delay.

12. In concluding these remarks upon the gold mining industry, I think I may perhaps fairly refer to the package of specimens I forwarded from this district through you for exhibition at Paris; I regret that the specimens were by no means what they ought to have been; the samples of tin, I admit, were comprehensive enough, but they are easily obtained. The specimens of gold-bearing quartz were, however, of a very limited character. The best were taken from Kitcher & Co.'s claim at Glen Morrison, and I forwarded them mainly with the intention of showing the valuable character of this reef, but had the Commissioners placed

any funds at my disposal I might have readily make the collection more complete and more satisfactory. I may perhaps be pardoned for pointing out to committees generally who undertake to collect specimens for the pupose of exhibiting natural resources, that private parties value those of the best description, and do not care about risking the loan of them. Hence the only way is to purchase them right out, and this I was of course unable to do through being unsupplied with funds.

Tin.

13. I purpose adding some statistics, in the form of Appendices to this Report, which may be referred to as illustrating the opinion I have formed as to the prospects of the Northern Tin Fields. To a very great extent my remarks as to the prospective value of gold-fields claims applies to those on the tin-fields. Several cases have been tried in the Warden's Courts which have forcibly exhibited the tenacity with which claim-holders resist any attempt to oust them from possession, even if that possession does not as yet prove of any very great value. This jealousy has perhaps been considerably fomented by the advent of numbers of Chinese upon the tin-fields, who, from being mere tributors, are now becoming proprietors of claims. Although the Chinese, as a rule, are satisfied with smaller returns than Europeans, and hence will work ground which Europeans will not touch, still they are possessed of more perseverance than falls to the lot of most European tin miners, who are as easily led away by tidings of a new rush in tin as in gold country.

14. The lack of water has had a good deal to do with either dispersing the latter or driving them to other pursuits; but an enormous amount of wash-dirt is stacked in most places, and a heavy rainfall will no doubt lead to a large amount of ore being on hand, which, when carriage becomes more plentiful, will find its way to market. As an example of the value of ground never opened up until the Chinese occupied it, £1,000 was lately offered a party of Chinese for their claim and refused. As a rule, however, the Chinese prefer working on tribute.

15. It is perhaps somewhat out of place to refer to the truth of the surmises I expressed in previous reports as to the permanent character of the tin-mining industry; but the firm establishment of the industry is now, as I predicted, an accomplished fact, and notwithstanding fluctuating markets, scarcity of carriage, and a somewhat irregular labour market, the tin miner, being as nomadic in his character as the gold miner, I see no reason to anticipate any diminution of interest in the development of the tin-mining industry, or that it will not for many years prove remunerative.

16. The accompanying memoranda will probably be of some interest containing as they do much useful and explanatory information obtained from the most reliable sources; and in closing this report, while regretting that in some respects it is not as satisfactery as many of its predecessors, I do not think it would be as gloomy were it not for the action of extraneous circumstances, which in a more favourable season would not exist.

17. This report is, I fear, somewhat too lengthy, but I could scarcely curtail it and at the same time do justice to the subject. It would have been forwarded earlier, but that I was compelled to await the receipt of the papers annexed, which appear to me to be very important.

APPENDICES.

Gold.

No. 1. Henry Roman, Rocky River.

Tin.

No. 2. Daniel Grove, Tingha.
3. S. W. Moore, do.
4. W. Litchfield, do.
5. Captain Swinton, do.

Extract from Mr. Henry Roman's Letter, re *Rocky River Gold Fields:—*

"In the early part of the year some little stir was made by the taking up and working auriferous lands at Cabbage-tree Gully, near the Kentucky. Three companies set in to work, employing in the aggregate fifty or sixty men. Favourable prospects were for some time obtained, and it was generally thought that a good yield of gold would be realized from the locality; however, the workings were not considered sufficiently remunerative, and were consequently abandoned. Since this abandonment some of the land has been reoccupied by Messrs. James May and company, and at the present time they are opening out their works under Mr. May's management. Mr. May, at Araluen, has large experience in working land of this character—alluvial stripping—and under his control it will no doubt be fairly tested.

"Within the last few months an attempt has been made to form two companies for working the deep wet leads northerly of Doherty's Hill: one of these, the Perseverance, for working land the property of Mr. William Cleghorn; the other, the Rocky River, for working Crown Lands abutting upon the Long Tunnel Company's property, being land formerly occupied by the Phœnix Company.

"It is very much to be regretted that through private jealousy and local apathy these undertakings have been allowed to fall through, there being very little doubt but their operations carried out would have opened up a vast extent of auriferous deposit, and have contributed highly to the advancement of local interests, and to the general benefit of the community. This land, being upon the main lead of the Rocky River, must be eventually worked; and as it is of such a character that a large capital must be employed to work it, it is not improbable that some considerable time may elapse ere another chance so favourable occurs of testing its undoubted richness.

"The works of the Long Tunnel Company are still progressing, though slowly. Contrary to expectation, they have encounted very hard rock. During the past year the principal part of their operations has been through solid grey granite, difficult to bore and blast; and at the present are working in rock, through which little more than 2 yards per month can be advanced, although men are kept continuously working. However, from what is known of the dip of the country, at the level of the tunnel there can certainly be but little more of this granite to go through, and this difficulty once surmounted it will not be long before the mine can be in full operation, and the shareholders reaping the reward of their perseverance and energy."

(*Report by D. Grove, Esq., J.P., Union Co.'s Mines, Tingha.*)

In the 10th section of your last annual report to the Mining Department, you prognosticated success to the Union T. M. Co., Cope's Creek.

I have the honor to inform you that your opinion of that date is now substantially confirmed, although the whole year was nearly consumed in acquiring forfeited and other forsaken blocks which we now reckon our most valuable property.

In order to advance the company's interests to its present standard, it became necessary to acquire a thorough knowledge of the best lands likely to become available in consequence of a depressed market, and the consequent collapse of all our tin-mining companies; also, to choose such lands as would enable us to keep up a payable supply of ore from deep or wet diggings in dry weather, and dry or shallow diggings in wet weather, and thereby keep the tributors and useful people we can find here on hand.

The Union Mines now include land held by the late Pentowan, Tingha, Anchor, Scotia, Victoria, Canadian (¼th), Sydney, Pendleton's, Pond's, and Karaula Tin Mining Companies—all by right of purchase; also, a number of mines all over the Tingha District.

Last year's produce and purchased tin amounted to 277 tons.

The company has been in existence nearly two years, and has laid out £1,500 in prospecting forfeited and purchased portions. It consists of three shares, held by the Hon. J. B. Watt, A. Stuart, Esq., M.P., and myself.

Most of the abovenamed companies were wound up in consequence of an opinion expressed in sections 3 and 4 (not your opinion) of your report—"That Cope's Creek was nearly worked out."

The Union thought otherwise, and considered the present course of the Cope's Creek watershed was not (except in occasional instances) the original bed, and speculated on that opinion.

The result is, that deeper ground and better deposits of tin ore have been found in the terraces which bound the creek.

For instance, the late Tingha Company sold out their right of 240 acres, in 20 acre blocks, for £100. One of which (portion No. 17), the block on which the late company's head quarters were situated, produced, last month, 35 tons from first paddock; and the one now stripped I estimate to yield 60 tons, or at the rate of 15 tons per week.

I have sent you a sample of the ore per Mining Registrar. The stripping is 25 feet; wash-dirt, 9 to 12 feet deep. I don't know the width of the vein, as we have not reached that point yet. It is now 2 chains wide. Tribute, £28 per ton. 50 Chinese working it.

Canadian.

This mine has been all but abandoned, in consequence of the creek being worked out. The Union struck payable tin last month, 250 yards from the creek, in a wide flat. I predict that this mine will prove as good as the former. Tribute, £30 first 10 tons, £28 after. 35 Chinese working it.

Scotia.

This mine produced over 100 tons last year, and is now one of the best mines held by the Union. 3 tributes at £28. 30 Chinese.

Pentowan.

Has not done much lately. Two tribute parties opening up last two months, both on payable tin. Tribute, £28. 24 Chinese.

Victoria.

This mine was also bought lately for £100. There are three tributes let on it, two at work, the other idle for water. This mine cleared itself in two months. European tributors drove under late manager's house, and have discovered the main Cope's Creek lead. I rank this mine with the late Tingha, Canadian, and Scotia.

These are all the Union Co.'s Cope's Creek mines—not one of them being worked in the present creek bed. I therefore (using your words) "feel warranted in auguring fair results for the year 1878."

The Union has also the Sydney T. M. Co.'s land, Middle Creek, and 15 blocks in the Ponds district, besides a great number of portions all over the field which have been all but abandoned in consequence of water-supply being insufficient to carry on operations. The whole of such land has been thoroughly prospected, and will be opened when rain sets in.

Karaula.

The Union bought the late company's land and plant, near Elsmore, on which they have erected a first-class engine and battery to crush the cement and supply ground sluice with water for surface washings. I send you a piece of cement, 56 lbs., which is a fair sample of the vein, and purpose sending you a report of this remarkable mine in a few weeks. The works start to-morrow ground-sluicing, and the battery next Monday.

All the above property has been acquired by maintaining the principles adopted and referred to at the outset of this report.

(*Report by S. W. Moore, Esq., upon claims at Tingha under his management.*)

In response to your telegram, received yesterday, I hasten to furnish you with a brief report of the mining operations carried on during the past year in connection with the several mines under my charge. In doing so, it will be only necessary for me to speak of the year's work, without going into a full description of the mines themselves, the nature of the workings, &c., &c.—for which information permit me to refer you to my report of last year.

The Britannia, has seen its best days. Nearly the whole of its creek ground—some of which was immensely rich—is worked out; and, although its back ground (principally surfacing) looks well in places, the continued dry weather has prevented us from doing much work. The consequence is a deplorable falling off in the yield—the actual quantity of ore obtained for the the year being less than 40 tons. Several tribute parties have been stacking dirt (on the back blocks), and are now patiently—I might add *idly*—waiting for the much needed rain. The average number of men employed has been something less than twenty.

The Arm, has produced during the year 50 tons of ore, of which 19 tons realized £650, or more than £34 per ton on the ground. The remainder is ready for market, but not yet sold. Average number of men employed, ten or twelve.

The Lizzie, which has changed hands—being now the property of Messrs. Hall Bros.—is looking extremely shaky. The main lead has been worked out; and, although further prospecting may reveal another run of tin through the block, I don't hesitate to say that this once famous mine has, like the Britannia, seen its best days. The quantity of ore obtained for the year was 30 tons, which realized nearly £960, or £32 per ton on the ground. It is only fair to state, that in consequence of a mining dispute, and the issue of an injunction restraining all parties from mining on this land, the workings were to some extent retarded.

In making a few general remarks, I might say that the year just brought to a close has witnessed no very great changes in mining matters. Certainly, a few important creek claims have become exhausted, and a few fresh finds have been made in the basaltic country; but the creeks—the cream of the tin mines—are failing fast, and new discoveries in the back country are being made very slowly.

Reefing too is at a complete stand-still, but this is owing in a great measure to the absence of some simple method by which the ore may be extracted from the stone. Probably, the year upon which we have just entered will know more of reefing than its predecessor.

Unless the prospecting of new country, and I refer more especially to the red ground or basaltic hills, be carried on with more energy than hitherto, I anticipate a falling off in the yield for the present year.

The quantity of ore which has passed through my hands during the past year—obtained from "Britannia," "Arm," and "Lizzie," and ore purchased—amounts to about 360 (three hundred and sixty) tons.

The average local price of ore for last year was between £33 and £34, as against £31 to £32 the previous year.

The average assay of the different ores is about 73 per cent.

Again let me remind you that the foregoing remarks are in themselves incomplete; however by reading them in connection with my last year's report, I trust you will obtain the necessary information to enable you to prepare your own general report.

My hurry to catch the next outgoing mail prevents me from reporting as fully as I should have liked.

I could not well begin my report until the close of the year, and, as to-day is the 1st January, you will perceive I am doing the best I can under the circumstances.

(*Report of W. Litchfield upon Mines at Tingha, &c.*)

I BEG to acknowledge receipt of your letter of 29th ultimo, *re* Report on Tin Mines, Cope's Creek Division.

I have very little to add to last report. We have had no new finds during 1877; occasional good patches have been worked on old workings that has tended to keep up the yield of ore for the year. The English portion of our population is not so large, but the Chinese are increasing; the latter are now working ground that was passed over some time ago as too poor to do anything with. Companies are nearly all out of date—the ground reverting to private parties.

There has been a great cry about the dry weather retarding our progress, but I think it has been in our favour. The principal of the ore produced has been out of the creeks. Now, if we had sufficient water to work the back ground, it would completely stop the creek work, and the yield would be considerably less.

The only way you can get an accurate account of ore produced, is from report of those who are despatching from the creek (purchasers or otherwise), viz.:—Captain Swinton, D. Grove S. W. Moore, Legge and Billin, and myself. There may be a few tons sent by others, but very little—the whole of the ore passing through the hands of the above parties.

For the year 1877, I have produced about 157 tons; consigned for others over 100 tons; purchased over 600 tons; total despatched about 857 tons or over—being an average of over 70 tons per month. The average quality is about 72½ per cent. Value on the mines, about an average of £33.

(*Report of Captain Swinton upon the Mines at Cope's Creek.*)

In reply to yours of the 29th November, I have to state that during the last year little has been done in the way of mining for tin ore. A few claims have paid fairly, but most have not more than paid wages, whilst many have been worked at a loss and have been obliged to stop altogether—this refers to the creek.

In what is called the back land it is impossible to say what might have been the result had their been water, many shafts having over 500 loads of wash-dirt to grass but no means of getting it ready for market; therefore, you cannot get men to prospect the land supposed to contain tin ore, where water is not procurable for sluicing, as the low price of ore will leave no margin after the expense of carting to the creek. I may mention, all dams have failed.

PEEL AND URALLA DISTRICT.

(*Mr. Warden Irving, P.M., Tamworth.*)

I HAVE but little that is new or important to report, as regards any increase of population or of the yield of gold or other minerals during the year 1877 in the portion of a mining division under my charge.

Quartz Veins.

There are only a few veins being worked. The following is the present state of the chief reefs:—

1. The Brown Snake Reef, which crosses the road from Nundle to the Hanging Rock, has been remunerating the small number of miners employed, as since August last gold to the value of £1,000 has been obtained by the labour of two men. The shaft is 50 feet in depth; the gold is found in patches; the vein underlies to the east, and bears north and south.
2. The reef in Spring Creek, Nundle, (Messrs. John Powell and party's lease) is being worked. I have heard of no results as yet.
3. Foley's Reef, at Bowling Alley Point, has been again worked for a few weeks. The trial did not give satisfaction.
4. Stephens and Stewart's old claim, known as the Golden Home, and sold by them to the Tamworth Company, has been taken up by some experienced miners (including Mr. Stewart) who are at present trying to overcome the water. I have no doubt, rich patches (like those found in this claim a few years ago) are still to be met with in this reef.
5. Mr. George Bond's reef at Quack-a-Nacka, near Foley's Folly, Hanging Rock. There are some 10 tons of stone ready for crushing on this reef. Mr. George Bond's crushing machine being driven by water-power, in the severe drought now prevailing it is impossible to ascertain the value of the stone.
6. Wheal Prosper Company's mine at Foley's Folly Reef, near Hanging Rock. The deepest shaft in this mine is 435 feet. A considerable quantity of stone is ready for crushing; but the crushing machinery in this mine, also being driven by water-power, is at a stand-still this dry season. Under these circumstances, no report can be furnished of the yield of gold from this mine.
7. The Moonlight Reef, between Nundle and Bowling Alley Point, has been idle during the year 1877.

The quartz reef known as the Marquis of Lorne, on the Peel River Land and Mineral Company's Estate, opposite Bowling Alley Point, is being worked night and day; the owners decline to state the results. It is rumoured they are still raising rich stone. Another reef on the same estate is being worked, with results it is stated equal to a yield of 2 ozs. and upwards of gold to a ton of stone.

Alluvial Mining.

Mount Misery Cement.—Great expectations have always been entertained by the people of Nundle that this cement would prove a very paying deposit, furnishing employment for a considerable body of men. The several parties at work on this cement lead are full of hope; the want of water wherewith to sluice away 40 feet of top-soil, however, effectually prevents the prosecution of alluvial mining in this locality.

Two parties of miners are tunnelling near the Hanging Rock, with a view to strike the continuation of the Mount Misery cement; as yet they have not reached the lead. There is only one alluvial claim on Hanging Rock, and this is being worked on tribute. It has not turned out very well.

The alluvial mining at Bowling Alley Point is at present confined to fossicking along the river-bed, as there is no water elsewhere to try a prospect with. The river has ceased to run in many places.

Minerals other than Gold.

Antimony mining is the only mining of minerals other than gold prosecuted in the district under my charge. Two men are at work on the antimony lode near Nundle. The deepest shaft is down some 60 feet. The lode does not increase in width, but remains varying from ½-inch to 5 inches in width. The ore is not very pure; it is mixed with a hard brown rock. Several tons of ore have been sent to Sydney by the proprietors; the result has not transpired.

Miners.

The number of miners employed on the Crown Lands portion of the Peel River amount to about eighty Europeans and seventy Chinese. There are from twenty to thirty miners employed on the Peel River Company's side of the river.

Machinery.

There is only one steam-driven crushing machine left on this gold-field. There are four water-driven machines, viz., the Wheal Prosper, Mr. Bond's, the Moonlight, and Mr. J. P. Robinson's. The value of the whole machinery is estimated at from £4,000 to £4,500.

Yield of Gold.

About 900 ozs. were derived from alluvial mining, and about 2,000 ozs. from quartz mining during 1877; say, total 2,900 ozs., valued at £10,500 sterling. This includes the gold obtained on the Peel River Company's Estate.

When we are favoured with a copious rainfall, I hope to see the Peel River Gold Field freshly prospected. Should this hope be realized, I am confident discoveries will yet be made calculated to attract a larger population, and revive the celebrity the Peel River once possessed, of being a good paying, if not a very extensive gold-field.

PEEL AND URALLA DISTRICT.

(*Mr. Warden Brougham, P.M., Bingera.*)

WHEN I had the honor to make my last report on the Bingera Division of the Peel and Uralla Mining District, I was in hopes that I should have been able to report in this annual one a marked improvement in mining at the various diggings; from the absence of water, men have been unable to prosecute the vocation of diggers to advantage.

In the early part of the year there was a good find of coarse nuggetty gold at Upper Bingera, and from its position I was under the impression it would turn out well, but it was only a patch. Gold has still been obtained from the same hole and its vicinity, but the class of men who are living there are too apathetic to open up the ground thoroughly, for as soon as they obtain £8 or £10 worth of gold they cease from working.

The Prince of Wales Copper Mine is not at present being worked, but I understand arrangements are now being made to carry on the work vigorously. No. 1 shaft is down to the depth of 100 feet; No. 2, 24 feet. The ore in both shafts still continues equal if not superior to the specimens forwarded to the Mining Department. They have about 200 tons of ore at grass.

There are a few men at Bobby Whitlow who are only making wages.

There are about forty men at work at Tea-tree Creek, Reading's Reef, Crow Mountain, Paling Yards, Wood's Reef, and Iron-bark Creek, but there has been very little work done.

The only find worthy of notice is one at Try-again Reef, Crow Mountain, where out of 16 tons of stone 66 oz. of retorted gold was obtained, also specimens to the value of £300. This stone was from the depth of 10 feet. The claim is now about 30 feet down, and showing gold-bearing quartz.

The total amount of gold from my division in 1877 amounts to 697 ozs., but considerable quantities have gone by private hands, of which I have no account. Should we be fortunate enough to have a good fall of rain this year, I trust I shall be in a position to report more favourably of the mining operations of 1878.

PEEL AND URALLA DISTRICT—INVERELL DIVISION.

(*Mr. Warden Fraser, P.M., Inverell.*)

MY appointment as Warden of the Peel and Uralla Mining District dating from the latter end of November last, there is very little to communicate of interest in this division.

The report of my predecessor, Mr. Warden Buchanan, will, as a matter of fact, be the Warden's Report for 1877.

The report of Mr. Jones, Warden's Clerk at Tingha, which I perused *in transitu*, leaves very little further for me to advert to.

Owing to the severity of the drought, mining operations, as in most other industries, have been greatly retarded. When the present drought breaks up I anticipate great activity on this field.

The population has not perceptibly diminished, though I regret to perceive in many instances the Europeans are succeeded by Mongolians, who muster several hundreds here.

On my arrival here I found great dissatisfaction expressed by business men and others, of the want of a Government site for a township in our midst, and I was given to understand that steps were being taken to bring the matter under the notice of Government. I quite endorse the opinions of the complainants. I consider they are fairly entitled to consideration at the hands of Government, and in the mining interests would urge the Department to move in this matter.

M'Intyre River.

ON this portion of the division, a change of ownership has taken place by the purchase of the Karaula Tin Mine by the Union Company. A manager and staff of miners are now at work, and with the extensive machinery plant at their disposal great things are expected therefrom.

The Elsmore has till recently been worked on tribute.

Since writing the above, heavy rains have fallen, and if the drought has actually broken up, Crown tenants under the Department of Mines will be enabled successfully to develope the vast mineral resources of this division.

PEEL AND URALLA DISTRICT—GLEN INNES DIVISION.

(*Mr. Warden Martin, P.M., Glen Innes.*)

THE subdivision of the Peel and Uralla Mining District committed to my care as Warden comprises a portion of the Police District of Glen Innes extending east and west about 48 miles with a mean breadth north and south of about 36.

A line N.N.E. from Ben Lomond on the southern boundary to Capoompeta in the Bolivia Range, intersecting the northern boundary at the Severn River, will fairly divide the district and the waters falling eastward towards the ocean from those flowing westward to the Darling and the Murray.

Consisting generally of an elevated table-land having a mean height of about 3,000 feet, well watered and well grassed even in this exceptionally dry season, its western half, with open plain and valley and circling basalt-covered ranges, is comparatively tame in physical outline, to the eastern, where erosive action in the valleys of the Henry and the Mann has laid bare the strata to a greater depth and given a greater relative height to the mountain ranges.

Geologically the district may be described as of granitic base, largely covered with basalt, and seamed with veins of quartz and eruptive dikes of elvan. I am not aware of the existence of any sedimentary rock, except near Glen Innes, where a perpendicular rift in the granite has been filled in with quartzose sandstone of so hard a texture as to be but little easier to work than the granite itself.

On the eastern border of the district, where the land falls away abruptly into the lower country, deep ravines, significantly termed "gulps," cleave the edge of the table-land; and here it is said slate is exposed in connection with gold-bearing quartz.

When the rush of miners set in to the North, consequent on the discovery of tin a few years ago, much of the district was searched for minerals with a perseverance and energy deserving of more remunerative success than seems to have rewarded the toilers.

Near Wellingrove, on the west, a lode of argentiferous galena, showing a vein of ore 14 inches wide, was opened out to a depth of 10 feet and then abandoned.

Following upwards the valley of the Severn, traces of tin were found almost everywhere, but not in paying quantities, except at Hogue's Creek and on the Big Flat, at the head of the Severn. Crossing the Grafton Road, tin was again found and mined for on Skeleton Creek, in the valleys of the Mann and the Henry, at Blair Hill, Kingsgate, Yarra Creek, Mount Mitchell, and at Oban. At this latter place tin was first found in the Colonies; and there and at Skeleton Creek are situated the only tin workings at present being carried on in any division east of the dividing range—to a very limited extent, however, not more than twenty men being employed at both places.

On this eastern watershed bismuth has been found in many widely separated places; and in one instance traced to the lode. Gold exists at Oban, at Oakwood, and at Glen Elgin, just on the Northern boundary; and topazes of large size, sapphires in abundance but of little commercial value, with a few garnets and amethysts, have been recovered from sand-drift in river and valley.

A few Chinese are mining in the alluvium at Oban for tin and gold; operations on even a smaller scale are carried on for gold at Glen Elgin by about ten Europeans; and at Starlight Reef, near Oakwood, nothing is being done to verify the asserted richness of the lode.

On the eastern watershed at the head of the Severn, about twenty men are mining for tin in the alluvium, and in the neighbouring ranges a shaft has been put down on a copper lode reported to yield 30 per cent of metal, but on which operations are at present in abeyance.

That a district so endowed as this is with mineral riches should not have taken a more prominent part in contributing to the realized wealth of the Colony, results in nowise from want of pluck and enterprise on the part of the prospecting miners, but simply from the unwillingness of men of capital to risk their money in speculations which in other countries are usually among the most attractive offered. Much of this distrust, no doubt, arises from losses sustained through the reckless dishonesty with which sham companies were floated during the mining mania a few years back, but a visit to the district would, I am sure, convince any sensible man that here lies as fair a field for investment in mining adventure as can be found in the Colony.

A case came lately under my notice where a working miner had, patiently and for months amidst much discouragment, traced a metal from the bed of a creek to its source in the lode, only to find himself baffled in his hopes by the very completeness of his success. Having no money to secure the land on which the lode (seemingly a valuable one of bismuth) is situated, he is obliged to await the turn of a tide which may flow too late for him, but which may, as in many another instance, bring easily acquired and unexpected fortune to others.

As illustrative of the formation of the district, and also with a view to afford miners and others readily accessible information on such subjects, I have been gathering geological and mineralogical specimens from the surrounding country to form the nucleus, I hope, as time wears on, of a most varied, complete, and interesting collection.

BARRINGTON GOLD FIELDS (BACK CREEK.)

(*Mr. Warden Charles Graham Smith, P.M., Dungog.*)

I HAVE the honor to report respecting the Back Creek Gold Field to 31st December, 1877.

The workings may be said to be now entirely confined to quartz mining. In July, 1876, a person named Saxby discovered gold in the creek some miles below the present workings. When the creek had been turned over, attention was directed to the mountain whence the gold had been washed, and several veins of gold, bearing quartz were discovered. From November, 1876, to date, about 180 miners' rights and 6 business licenses have been issued, and nearly 60 gold mining leases have been applied for.

The veins do not, as in most other fields, run in a uniform direction in the main, but seem to tend towards every point of the compass. They have been found on both branches of Back Creek, and for the most part on the inner slopes of a horseshoe shaped curve of the main range, down the centre of which curve there runs a long narrow ridge, having gold-bearing veins along the crest, and affording facilities for forming a comparatively good track for conveying stone to the mills. There is at present but one mill at work of 10 stampers, but the speedy erection of another, of greater capacity, is contemplated.

One public-house is now open, and two others nearly completed; there are several stores, and the survey of the township will shortly take place. The total population on the field is about 250. The place seems to be healthful, but the locality of the workings is exceedingly steep and rough, with a dense vine-scrub offering much hindrance to the Mining Surveyor.

I think the following may be relied upon as a tolerably fair acount of the principal claims:—

Right-hand Branch.

		Width.	Depth.	Prospects.
Rose and Thistle	Prospectors ...	9 inches	30 feet	Doubtful.
	No. 1 S. W. ...	12 ,,	35 ,,	Very good promise, coarse gold.
Anthony's	Prospectors ...	12 ,,	45 ,,	Fair—not well defined.
	No. 1 West ...	6 ,,	25 ,,	Uncertain, best at 15 feet level.
Mechanics'.....	Prospectors ...	...	6 ,,	Payable.
	No. 1 South ...	15 ,,	40 ,,	Very fair promise.

Left-hand Branch.

		Width.	Depth.	Prospects.
Rainbow	Prospectors ...	9 inches	35 feet	2 ozs. to ton.
	No. 1 East......	...	...	About 2 ozs. to ton.
Mountain Maid.........	Prospectors...	10 ,,	55 ,,	Very good promise—driven along vein, 17 feet east and 16 feet west, with similar results
Hidden Treasure	Cameron's	20 ,,	8 ,,	Stone payable.
Town and Country . .	......	...	17 ,,	Uncertain, owners persevering, vein widening.
Centennial	Prospectors ...	12 ,,	38 ,,	Payable.
	No. 2 South ...	6 to 15 ,,	50 ,,	Driving north, said to be rich and improving.
Anderson's	.....	18 ,,	20 ,,	Fair show.
	No. 1 East......	...	30 ,,	Payable.
	No. 1 West ...	6 to 9 ,,	...	Payable.
Cornish	......	15 ,,	35 ,,	Thought payable.
	No. 1 South ...	... ,,	...	Said to have good stone.
Star of the South	......	6 ,,	...	Promises well.
	No. 1 East......	... ,,	...	Uncertain.

Other gold-bearing veins have been lately discovered on the other side of the range, said to be from 6 to 30 inches wide. Of these the Great Britain, Lord of the Hills, Morning Star, and Murphy's are named as the most promising.

The above information has been principally obtained from two or three intelligent, and I believe perfectly reliable miners, whose claims I have visited. The people are naturally very sanguine, so many veins producing gold having been found; although perhaps one well-defined reef, with only occasional deviation from its general course, would give better promise of permanent work.

NEW ENGLAND AND CLARENCE DISTRICT.

(*Mr. Warden Graham, P.M., Tenterfield.*)

I DO myself the honor to submit you my annual report on the mines situated in that portion of the New England and Clarence Mining District under my charge.

The protracted drought (existing now over three years) has been seriously detrimental to the mining interests; the water-courses are completely dried up, and it is only those mines which are fortunate enough to have a storage for water that are now working. Gold mining is almost at a stand-still, in consequence of the want of water. The tin mines although greatly suffering are more fortunate, but the increased labour necessary to store and pump water for sluicing purposes seriously affects the profits of the mines, and renders large areas at present unworkable.

It is satisfactory to be able to report, that in spite of such adverse circumstances as want of water and the continued low price of tin, that the mining for that mineral continues remunerative, and that such large quantities of the ore are still being won from the mines in this district. It is also satisfactory to know that the discovery of new finds fully keeps pace with the exhaustion of the old workings.

At Vegetable Creek the new discoveries of alluvial are of great importance and extent; the principal one at present is that on the supposed old bed of the Graveyard Creek, situated between the Y-Waterholes and Vegetable Creeks. On this run Messrs. Cadell, Mitchell, and O'Daly have 500 acres of land under mineral conditional purchase, on which extensive prospecting has been done; in fact, the run has been so thoroughly prospected as to prove beyond doubt that an old creek-bed of far greater extent than any of the present water-courses in that locality exists and is rich in stanniferous deposits. The lead has been traced through adjoining lands, and promises to be of great extent and value. For full particulars as to this important lead, I must refer you to Mr. Mining Registrar Gower's report, and especially to the tracing accompanying it.

I am quite convinced that the alluvial in the locality of Vegetable Creek will yet last for many years, and that the yield of these mines, when again favoured with a sufficient supply of water, will be as great, if not greater than ever it was. The present yield does not fairly represent the value or importance of the mines.

In addition to the alluvial at Vegetable Creek and in that neighbourhood, is the lode or reef mining; this is now making great strides and coming prominently into favour with the miners. Many valuable discoveries have been made, and the richness of some of the lodes now working puts beyond doubt the fact of our having vast and inexhaustible mineral wealth.

Some of the reefs have turned out very rich, one in particular, the property of the Gulf Stream Tin Mining Company, which averaged a width of 3 feet, giving 60 per cent. of ore. This lode for some time pinched out, but is now making again, and still continues as rich as ever. Some energy is now displayed by miners in prospecting for lodes.

The want of machinery and capital will for some time militate against the development of the lode mines, but I have no doubt that that will eventually be overcome.

The Mole Table-land Mines which for some time have been deserted, have made a fresh start, and payable tin has in many places been discovered. In this wet and swampy country it was until this dry season almost impossible to prospect, in fact now great difficulty is experienced in bottoming in some of the swamps.

Some considerable areas of land have been taken up, and there is every prospect of these mines again becoming remunerative, especially with Chinese labour, which is now rapidly increasing in this district. There are many good payable reefs in this locality which only await capital and enterprise to develope.

On Silent Grove there is a good lode opened; the stone is stated to be very rich, and the reef about 2 feet wide; it is the property, I believe, of Messrs. Towns & Co., of Sydney. A first-class crushing plant and tin separating machinery is in course of erection, and now almost completed. The mine and works are under the management of Mr. Henderson.

I have not had an opportunity of visiting this mine, but I am reliably informed that there is every prospect of its turning out a successful undertaking (the spirited proprietors certainly deserve that it should do so). As I intend making a special visit to this locality, I must defer my further report on so important an undertaking until some future time.

The demand for mineral lands is still rapidly increasing; the amount of land applied for at the Vegetable Creek Office, under mineral lease, for the year 1876, was 1,360 acres, and for the year 1877, 2,760 acres. There was also during 1877, 1,420 acres applied for under mineral conditional purchase, at the Tenterfied Land Office. This land is not now taken up, as it originally was, by rash speculators, but it is principally by *bonâ fide* miners, after prospecting.

On the Maryland mines there is not much change from last year (1876); want of water is there, as in other places, a great drawback.

The majority of miners in this field are Chinamen, and the working chiefly carried on under tribute. The most productive and remunerative mine on the New South Wales side is on the Herding-yard Creek, the property of Messrs. Amos Brothers, and under the management of

Mr. Seamen. This mine is most economically worked, every appliance for labour-saving is used, the pumping is done by an 8 horse-power steam engine and centrifugal pump, 8-inch, and the works are well laid out. An average of 75 men (Europeans) are employed on wages, and the yield this year was 482 tons of ore. The face on this claim is very wide, the stripping averages about 6 or 8 feet, and about 2 feet of wash-dirt.

The total quantity of ore raised on the Maryland mines (New South Wales portion) was 1,400 tons, showing a decrease of 100 tons from last year. The claims working are fairly remunerative, and will probably last for some considerable time yet; large areas of country now lying idle will be worked when water is more plentiful and price of tin improves.

Four hundred and eighty (480) acres of land have been applied for under mineral lease during the year 1877 on the Maryland mines.

It is almost impossible with my various duties and large district to make anything but a general report on the mines under my charge; or more detailed information I must refer you to the reports of the various Mining Registrars, who being in the immediate vicinity of the mines have greater facilities for obtaining the necessary information. I would do myself the honour to particularly draw your attention to Mr. Mining Registrar Gower's exhaustive report, forwarded to you on the 29th ultimo. This report is compiled from information obtained by him during a recent tour of his district, and the information it contains can be depended on as reliable.

There can be no doubt but that tin mining is now a permanent and important industry in this Colony, giving employment to a large number of miners, and one which I have no doubt will soon rapidly increase in importance. Up to the present time great difficulties have had to be contended against. In the first instance, rash speculation and over-estimation of value, and in many cases careless or worse than careless misrepresentations, during the mining mania of 1872–3, had the effect to withdraw capital and confidence from our mines; secondly, the rapid and unforeseen decline in price of tin; and, lastly, the combination of these two causes with a drought now existing over three years. But I feel no hesitation in stating my opinion that the prospects of permanency and richness are better now than ever they were, and I firmly believe that tin mining in this district is only in its infancy.

It is much to be regretted that so much land is now being taken up under mineral conditional purchase, as it is thereby taken from under the control of the Mining Act, and labour conditions cannot be enforced.

Gold.

In consequence of the continued drought very little work is now doing on the gold-fields in this district.

At Dalmorton, the Clarence Pioneer Quartz Mining Company have suspended work. There is some little work going on on some reefs about 7 miles east of Dalmorton. The Homeward Bound crushed 44 tons for 16 ozs. The Scottish Chief, 8 miles N.E. of Dalmorton, is abandoned in consequence of difficulty of carting stone to crush. There are several good reefs in this locality abandoned from the same cause; the country is very rough, and the reefs are on precipitous ranges, and almost inaccessible. Capital alone can develop these reefs. In this neighbourhood the alluvial is almost worked out; only six men are now working. The total amount of gold for the year 1877 is about 150 ozs. There is a rumour of a silver mine having been discovered, but I have no reliable information on the subject.

At Lunatic and Perseverance a little work is doing, and a small quantity of gold obtained. (See Mining Registrar Synge's report.)

The prospectors' claim on Slaty Creek is working, and has had a crushing which yielded 1 oz. 7 dwts. to the ton.

Pretty Gully and Tooloom.—Very little work is doing.

Solferino is almost deserted. There are a few men employed at the Lion Reef, Lionsville. There are only about fourteen men employed on this field.

Boorook is again coming into notice; some new leases have been taken up, and a crushing-plant is now in course of erection by Mr. T. Horton. The reefs on this field will be again tested, and I trust with better results than formerly.

On Poverty Point the works are progressing satisfactorily; a race of 8 miles long is now nearly completed. As soon as water is brought in, hydraulic sluicing will be used. This claim is under the charge and management of Mr. Ambrose Johnston, a gentleman of great experience in mining, and I have no doubt it will be remunerative.

Antimony.

The antimony mines at Lunatic are again working; some 36 tons have been sent to Sydney lately.

NEW ENGLAND AND CLARENCE DISTRICT—LISMORE DIVISION.

(*Mr. Warden Elliott, P.M., Lismore.*)

I HAVE the honor to report upon the state of mining in the division of the New England and Clarence Mining District under my charge.

During the past year 39 miners' rights were issued—16 in April, during which and the two following months about twenty men made an average of 1½ ozs. per diem on the ocean beach, near Ballina. Since then very little has been done, and during the last three months absolutely nothing.

I believe there is an unlimited quantity of gold-bearing stone on the coast range between the Tweed and Richmond Rivers, but no attempt has been made to work it. Small parcels of stone have been sent to Sydney from time to time by Mr. E. Coleman, a storekeeper in Lismore, for the purpose of being tested, and the largest yield reported was at the rate of 19 ozs. 11 dwts. 22 grs. per ton. The last parcel, however, of about 2 tons of stone, forwarded last month, and crushed at the Mint, only yielded a trace.

It is highly desirable that a competent geologist should examine and report upon this portion of the district, for I cannot ascertain that it has been seen by any one capable of forming a reliable opinion.

MINING REGISTRARS' REPORTS.

BATHURST DISTRICT—BATHURST DIVISION.

(C. E. B. Maybury, Mining Registrar.)

Gold.

IN my Report for 1876 I commenced by stating that "Gold mining within the division was almost at a standstill," and with equal truth I may repeat that statement as regards the year just closed; for there has certainly been no improvement, but, on the contrary, the continued dry weather has tended to retard the operations of prospecting parties and claimholders, who solely constitute the gold mining population of this division. At Glanmire especially has the lack of water interrupted mining work, and during a part of the year at least compelled a large proportion of the miners to find other means of making a living. I shall be glad if in my next report I am able to inform you of a reaction in the gold mining industry of this division, for it is not improbable that the convictions of many would be proved correct were the district subjected to a thorough prospecting, and its gold-yielding capabilities be shown less insignificant than at present they appear. The quantity of gold transmitted by escort from Bathurst to Sydney during the year amounted to 3,901 ozs. 1 dwt. 7 grs., showing a decrease on the previous year of no less than 1,277 ozs. 15 dwts. 3 grs.

Minerals.

The mining operations included under this heading are in this division far more extensive and important than those connected with the "precious metal," though until very recently they have been confined to the raising of copper.

Copper.

I attach detailed reports of the copper mines at Wiseman's Creek, Dirty Swamp, and Apsley, the Belmore Mines near Cow Flat, the Green Swamp Mines at Green Swamp, and the Esk Company's Mine at Wiseman's Creek, giving in each case the number of men employed, description of the machinery used, the value of the plant, the depth of shaft, width of lode, &c., the quantity of ore raised, and its value. It is satisfactory to find by comparison that the quantity of ore raised during the past twelve months has been considerably larger than during the previous year, and reaches, in the aggregate, 1,774 tons.

Apsley Mine.—It may not perhaps be out of place for me here to state, that by prospecting, the ore has been traced further north than it had been hitherto found, in payable quantities.

Belmore Mine near Cow Flat.—A considerable amount of prospecting has been done during the past year, and this important fact established, that payable sulphurets of copper exist underneath the surface deposits of carbonates. This had not before been demonstrated.

Before concluding this part of my subject, I desire to express my indebtedness to the Managers of the various mines referred to for their hearty co-operation, and the valuable assistance they rendered in the collection of information respecting the mines under their control.

Iron.

During the year, a very important discovery of iron has been made at Back Creek—some 20 miles from Bathurst—on the land held as a mineral lease by Messrs. George Hayton, Michael Bowler, and Michael Toomy. A company has been formed to work the mine, and they are sanguine of a rich return. The following article, extracted from the *Bathurst Free Press*, of the 29th December ult., furnishes an authentic report of the discovery, and of the work that has already been effected:—

"Discovery of Iron at Back Creek.

"FOR some time past the Bathurst people have been crying out about the dullness of trade, and the absence of miners and strangers from the town consequent upon the failure of the gold and copper mines of the district. From present appearances it is to be hoped that these complaints will shortly cease, and that our city will again be flourishing as in the past. It has frequently been asserted that New South Wales abounds with minerals, and the Western districts of the Colony have before this proved that nearly every mineral is hidden under the surface, if only it could be brought to light. The excitement of the gold discoveries at Hill End and its neighbourhood, as also the copper found at Cow Flat and other places, has to a great extent died away; still there are many who have not given up the idea that the day is not far distant when a great deal of money will be made from these now partially deserted fields. The latest discovery of ore in the district of Bathurst is that of iron. For some weeks past the topic of conversation in some circles has been the recent discovery of iron ore at Back Creek, a distance of 19 miles (by rail) from Bathurst. Being at Back Creek on Boxing Day, our reporter interviewed the party who first found indications of the iron, and we give below a statement made by him relative to the discovery. The name of the party is a George Hayton. For some years he was connected with some iron works in England, but after his arrival in the Colony he accepted employment on the railway. He was so engaged at Back Creek, and during some of his rambles after work hours he found some indications of iron. Upon further search, he found a lode distinctly defined, and he procured samples, which, in March last, he forwarded to Sydney and Bowenfells. The reports from both places were very favourable, being to the effect that the ore would yield from 50 to 75 per cent. of iron. Mr. Hughes, manager of the Lithgow Iron Works, next visited the spot, and expressed himself highly pleased with the prospect. He thought there was no doubt about the quality of the ore, and agreed to take 500 tons on a trial. Since then 155 tons of the ore have been forwarded to the Smelting Works at Lithgow, but the result is not known yet, as it was being smelted on Friday and Saturday last. A company has been formed, in which there are six shareholders. Mr. Hayton has been appointed manager for the company, and six men are engaged unearthing the ore. A mineral lease of twenty acres has been taken up, and an acre of land adjoining has been purchased from the Rev. R. Rogers; this forms the extent of the ground intended for the operations of the company. The greater portion of the land is hilly, and it is intended to commence at the foot, and put a main cut up the centre of the lode, which is at the top of the hill. The lode is traceable on the surface from the opening to the railway fence, a distance of about 15 chains; and the breadth of it, from surface indications, is estimated to be between 100 and 200 feet. The place is only a very short distance from the railway station, and the ore is carted from the works to the trucks at the station, from which place it is forwarded to Lithgow. There are now about 150 tons ready to send away, but the scarcity of carts and railway trucks is a difficulty in the way of progress. The company would be able to keep a couple of teams in almost constant work, as they hope after the holidays to be able to send away between 150 to 200 tons of ore every week. The Government should also endeavour to support this mine, and place as many trucks at their disposal as possible. A sample of the ore may be seen at the office of this paper."

Population.

As I mentioned in my last report, it is almost impossible to obtain reliable information respecting the number of miners at work in this division, but judging from the answers given to my inquiries there seems to be no material difference in the numbers from those given for 1876, viz. :—

		Europeans.	Chinese.
Gold Miners	Alluvial	25	50
	Quartz	10	20
Other Miners		100	
Total		135	70

BATHURST DISTRICT—TRUNKEY DIVISION.

(*Thomas Waldie, Mining Registrar.*)

IN submitting this my third Annual Report of this gold-field, I will no doubt have to show that the returns for 1877 are far short of 1876, but I will also show that for the number of quartz miners employed, few fields exhibit a better return or the miners better remunerated for their labour. In alluvial the miners are at a complete stand-still owing to the continuous dry weather. For the first six months of the year the two puddling machines in the township did well, particularly Walsh and party, who report themselves highly satisfied with their returns; and I have no doubt but had there been a sufficient supply of water there would have been a number of machines put down, as there is an unlimited quantity of wash-dirt to work at.

Quartz.—The most of the quartz is raised on tribute from the various reefs running through the Trunkey Creek Gold Mining Company's ground.

Although the number of miners' rights taken out during the year is 61, yet a great number of the miners who took them out left the division about the months of June and July, so that it is only fair to say that the alluvial return of 870 ounces 7 dwts. is for little more than six months, a good many of the miners being employed in other ways waiting for rain to set them to work gold-getting. At Pine Ridge a large water-wheel 40 ft. in diameter was erected to work the large lode there, but owing to the want of water it has been almost at a stand-still for over twelve months. There are 15 head of stamps, but only 10 have been at work, and they not more than a week or ten days at a time; but I have been informed that what has been crushed has paid well.

The annexed table will show the number of quartz miners employed and the time they have worked, with the quantity of quartz and the yield, which, as I before stated, will show that a fair remuneration has been got for the labour :—

No. of men.	Time worked.	Quantity of Quartz raised.	Yield per Ton.
			ozs. dwts.
8	12 months	......	......
4	5 ,,	515	436 10
6	3 ,,	......	......

I submit, these returns show that there is plenty of gold in the Trunkey Reefs, and only wants getting out.

BATHURST DISTRICT—TUENA DIVISION.

(S. J. Cotter, Mining Registrar.)

NOTHING of much account is doing at present either in quartz or alluvial mining. In the former, the holidays; and in the latter, the want of water, is the cause. But excuses are of little avail. The facts are that the gold produced on the field grows "small by degrees and beautifully less"; that the township is rapidly becoming a matter of tradition; that though on the whole the number of miners has not diminished, yet many are compelled to spend a large part of their time at any other available work, and that Peelwood itself is far from lively at present.

In quartz mining, work has been steadily kept up throughout the year at Towns & Co.'s "Washington," under the management of Mr. Zouch, whose steady application, energy, and thoughtful economy, deserve success, as well as a passing word of appreciation. The main object has been the recovery of the original reef, which, after proving very rich, was suddenly lost. I am not aware that this has yet been done, but several rich veins have been struck, yielding sufficient to pay working expenses and to yield some amount of profit.

The prevalent drought has brought alluvial mining to a stand-still, as there is no water for washing or sluicing. The same cause has operated in a similar manner through a great part of the year. A temporary impetus has at various times been given by the finding of a nugget in wash-dirt of 4 ozs. 3 dwts. by C. Jenkins; one of 3 ozs. 6 dwts. 2 grs. by C. Payne; one of 2 ozs. 15 dwts. by F. Barnett, and one of 2 ozs. 6 dwts. by J. Cooper. As soon as water is available, sluicing is likely to be resumed with vigour for a time at least.

Work has been briskly, and on the whole, I understand, profitably kept up throughout the year at the Peelwood Copper Mine. About 70 miners and smelters, 16 teams, and 16 wood-cutters are employed, and the mine still supports a considerable village.

BATHURST DISTRICT—CARCOAR DIVISION.

(W. Badcock Warner, Mining Registrar.)

THE year just closed has been a trying one for the miner in this district. The prevailing drought of the previous year has been intensified, and the only part of my district in which gold mining has proceeded without interruption has been the alluvial diggings at Lumpy Swamp. The workings at this place are in very wet ground, and sufficient water is bailed from the claims to wash the stuff raised. The dirt is lifted from a depth of 80 to 120 feet, and has, during the past year, been fairly productive, several good parcels of excellent gold having been disposed of by claim-holders either in Carcoar or Orange; for instance, one lot of over 800 ozs. was sold by Hennessy and party in Orange, and another lot of over 200 ozs. by Carney and party to the Commercial Bank, Carcoar.

Within a distance of about 3 miles is the important alluvial mining locality of Flyer's Creek, where operations have been suspended for at least one half of the year for want of water. The workings here are all on the surface, the ground being washed away to a depth of from 12 to 20 feet down to the bed-rock, and requiring for its proper treatment a plentiful supply of water. This not being forthcoming has in several claims stopped all work for months, and at the time I write there is not the slightest prospect of any change in this respect. The above are the only localities in my district in which alluvial mining is carried on on an extensive scale.

The most important gold mine in this district is that worked at Brown's Creek, on the Church and School Estate, by the Brown's Creek Gold Mining Company. An alteration has taken place in the proprietorship of this mine during the past year. The yield of the mine is considerable, although the average per ton of stuff is very small, amounting only to a fraction over 1 dwt. 12 grs. The want of water has prevented the treatment of the ore for about half the year. The total yield for 1877 for six months working was 1,477 ozs. gold, worth about £3 per ounce.

The oldest quartz mining claim in the district—the Prince of Wales, at Burnt Yards—after working for about ten years, and during that time producing some thousands of ounces of gold was, in December last, sold by auction in Carcoar. The purchasers are endeavouring to form a new company to carry on the workings (which have now reached a depth of about 400 feet, being the deepest mine in my district) in a more scientific manner. The general disinclination to venture in mining speculations at the present time has hitherto prevented the accomplishment of this very desirable end. During the year several very nice cakes of gold have been sold in Carcoar from T. Lane and party's prospecting claim at Gully Swamp, which must have paid very good dividends to the three working shareholders. The working of this claim will probably lead to litigation in the Warden's Court early in the year, as the claim in question is supposed to be in the centre of a mining lease which has not been cancelled.

The total amount of gold sent down from Carcoar by escort during 1877 was 3,043 ozs. 11 dwts. 9 grs.
„ „ „ „ 1876 „ 3,548 „ 13 „ 8 „

This return would indicate a falling off to the extent of over 500 ozs. for 1877 as compared with 1876, but bearing in mind the quantity of gold sold in Orange from Lumpy Swamp, I should be inclined to think that more gold was obtained in this district in 1877 than in 1876. The Brown's Creek mine, which is credited with nearly half of last year's yield, only worked six months in the year. Taking all these circumstances into consideration, I am inclined to think that the falling off shown by the escort returns for the last two years is due solely to the want of water.

During 1877 I sold 57 miners' rights and 3 business licences.

COPPER.

There have been two copper mines at work in my division, viz., the Milburn Creek and the Coombing Mine. The manager of the former mine, which has recently changed hands, under a decision in the Supreme Court, is unable to furnish me with returns of ore, &c., required by my circular to him. The manager of the latter mine will forward the returns required in a few days. The only return from a gold mine yet received has been furnished by the manager of the Brown's Creek Gold Mining Company, who has replied with commendable promptitude.

BATHURST DISTRICT—COWRA DIVISION.

(*John Arkins, Mining Registrar.*)

I HAVE the honor to forward herewith my Annual Report on Gold Mines within my division of the Bathurst Mining District for the year 1877.

My division consists of only a small portion of the Bathurst Mining District, situated within the Police District of Cowra.

There are no claims being worked within my division for minerals other than gold. There are two gold leases taken up by M'Donald and party at Wood's Flat, within 12 miles of Cowra, being worked at intervals. From want of rain, and consequent scarcity of water, little or nothing has been done during the year. For several months the work has entirely ceased from that cause. Several parties are waiting for water.

A party of four reported a find of payable gold at Jack's Creek and registered a prospecting claim, but it turned out that the claim was on private property. They must have abandoned it as I have not heard of them since.

Mr. P. Murray, storekeeper, purchased 54 ozs. during the year; Messrs. Austin Brothers purchased about 12 ozs.; John Muir purchased about 12 ozs.—in all 78 ozs. The manager of the Australian Joint Stock Bank did not purchase, as there was no escort. The Messrs. M'Donald sold their gold in Carcoar.

BATHURST DISTRICT—OBERON DIVISION.

(*Chas. W. Cunningham, Mining Registrar.*)

There are but two gold miners in this division, and they have been prospecting.

The South Wiseman's Creek Copper Mines are not at work; but the Wiseman's Creek Copper Mining Company are raising some fine ore at present, and have smelting works erected at the mines.

BATHURST DISTRICT—ROCKLEY DIVISION.

(*Thomas C. Cromie, Mining Registrar.*)

THE mining interests of this division are at present at a very low ebb. Owing to the protracted drought of the last three years, large areas of old alluvial ground is now abandoned for the want of water, as the only way that the miners can work it to advantage is by ground-sluicing.

Quartz reefing is now among the things that were. The only crushing machine in this division is at Swallow's Nest, and owned by the Messrs. Crozier, who are now altering the machinery to work a puddling machine.

With the exception of Wiseman's Creek, none of the copper mines at present are payable.

BATHURST DISTRICT—MITCHELL'S CREEK DIVISION.

(*Samuel Shumack, Mining Registrar.*)

GOLD mining for the past year has not been so brisk as the previous year. The Winterton Reef, Sunny Corner, is not so good as was expected; it is very patchy now; sometimes it looks well, and other times very bad. There is a 10-acre lease same place which yielded some very rich stone, at present it does not look so well; also a 20-acre lease, same place, shows well; it is the opinion of some experienced miners that these leases are not properly tried yet, and that they will turn out well again. Want of water the past year has been a great drawback at Sunny Corner. At Mitchell's Creek there has been a good deal of stone crushed by Mr. F. Robertson, who has been nearly continually at work. Not much doing at Dark Corner. On the whole there has been no improvement the past year in this division.

TAMBAROORA AND TURON DISTRICT—HILL END DIVISION.

(*W. C. Weston, Mining Registrar.*)

As Mr. Warden Sharpe is forwarding you an exhaustive report on the same, my information would, in a great measure, be but a recapitulation of his. However, I may state, for the information of the Mines Department, that mining at the present time is at a very low ebb, but many people here are of opinion that we are on the eve of better times.

During the year 1877 the issue of miners' rights and business licenses has exceeded the number issued in 1876, thus incontestably proving that more people have been engaged in mining pursuits than in 1876, and although (to use the words of Mr. Inspector Slee, and no better authority exists) no new reefs have been struck, still the miners are in good hope of soon having a different tale to tell.

The South Star Line on the Turon, about 4 miles distant from the Hill, has many admirers, and four parties are now at work there.

The Hawkins' Hill claims are mostly engaged at their usual work, the Star of Peace being the deepest; they will soon be 800 feet deep, and should they strike gold at that depth we may fairly expect matters to assume a brisker appearance. During the past year a new reef, or rather an old one, has been re-opened at Tambaroora, the Valentine, and excellent prospects obtained, so much so as to induce Fischer and party, who have a 10-acre lease there, to put on extra labour, with a view of testing it more quickly, they are very sanguine of success, and I am inclined to think it is one of the richest reefs in the district; it has never been thoroughly worked, although stone has been got from it which, on crushing, yielded some 30 ounces to the ton.

At the Quartz Ridge good payable stone has been struck; the vein is wide, and any quantity of stone might be obtained if the men would work; it does not say much for the energy of men who talk of throwing up a claim with stone in any quantity going an ounce to the ton, and only some 70 feet sinking, and a battery within a stone's throw of the claim.

The Cement Hills on the Macquarie River, some 12 miles from Hill End, are quite deserted. Both Messrs. Chappell & Co.'s plant and Mr. Rossitter's having for some months ceased working, this is to be much regretted as I have no doubt that time would have developed some rich patches. Mr. Chappell, than whom a more experienced and energetic miner does not exist, is still of opinion that it would have eventually paid handsomely.

I have forwarded some forty circulars to the different managers of mines, requesting statistical information, but as yet have only received some seven or eight back.

On the whole then, I conclude the Hill is not in so prosperous a state as it was at the end of 1876. There is nothing beyond gold mining to support the place, as the country around is too mountainous and barren to grow any cereals in sufficient quantity to pay the grower or supply the wants of the population, and unless some new reefs are discovered I fear the already diminished population will be less.

I may observe in conclusion, that more than two-thirds of the present miners are not a prospecting class of people; they are wages men, and appear thoroughly content if they can get their wages; lots of others will not prospect unless they have what they term backers, in fact most of them being married men with families (and this is a famous place for children) they say they cannot afford to prospect. Therefore unless some inducement is held out in the shape of a government subsidy it will only be by accident that any new reefs are discovered.

The number of miners' rights issued at Hill End during the past year was 632, and 28 business licenses, and the quantity of gold obtained from all sources 20,433 ozs. 2 dwts. 6 grs.

Since my annual report was transmitted, I have been able to obtain some further particulars with reference to the Star of Peace mine, which I have the honor to submit for the information of the Honorable the Secretary for Mines.

The rich veins formerly worked in Paxton's mine, could not (until the discovery I am about to mention was made) be traced into the adjoining mine the Star of Peace, although various cross-cuts were put in at different times by different managers. About a fortnight since at the 160 feet level, about 12 feet east of Paxton's veins and about 20 feet from Paxton's boundary, are three veins known on Hawkins' Hill as the Easterly Working. A crushing of 28 tons was taken out and gave the handsome return of rather more than 10½ ounces to the ton; besides the stone crushed, about 80 lbs. of really magnificent specimens were sent to Sydney, I am informed for transmission to the Paris Exhibition. Having taken out this rich patch the company are now driving south, leaving the veins standing which are apparently payable. I may add that this discovery will not benefit the mines south of the Star of Peace, because in them the veins containing the shoot of gold have been taken out, but there is a probablity that some of the mines on the north may strike the same shoot of gold perhaps still further towards the east.

TAMBAROORA AND TURON DISTRICT—SOFALA DIVISION.

(*M. Fagan, Mining Registrar.*)

Box Ridge.—There is little doing at this place, there being only two parties at work on Hans' Line of Reef, viz., the prospectors and a 4-acre lease adjoining on the south.

The former party had a crushing from their claim about a month ago of 18 tons, the result of eight weeks work for two men, which yielded 3½ ozs. to the ton, they are now busily engaged raising stone and hope to have another crushing in a few weeks.

No. 1 South are working but have not yet cut the reef; they are however in daily expectation of doing so, and are most sanguine as to the result of their labour. The vein has a westerly underlay, and, as there are at least two gold-bearing veins in close proximity to the west having an easterly underlay, they will eventually unite and form one main reef, probably at a depth of from 150 to 200 feet.

Homeward Bound Line of Reef.—This vein was worked about ten years ago with payable results, the stone raised averaging 2 ozs. to the ton, the reason of its being abandoned being the influx of water. Some time since a shaft was sunk to cut the vein at a depth of 100 feet, but as the parties had not the proper appliances for baling, it was given up when at a depth of 70 feet. Were this shaft continued down there is little doubt but payable stone would be obtained. Some few weeks ago a crushing was taken out of this cut to the south of the old workings and above the water-level, the result being 1 oz. 2 dwts. to the ton.

Shakespeare Line of Reef.—This reef was first opened about 12 years ago and has been worked by several parties with various returns, averaging from 18 dwts. to 3½ ozs. to the ton; as there is a large amount of stone obtainable in this reef all that is wanted to render it payable is good machinery.

Wattle Flat.—Surface Hill. The ground held by Moyle's Surface Hill Gold Mining Company is situated on Surface Hill. Work has been steadily carried on during the year. The tunnel driven to the north has been extended to a distance of 416 feet. The vein in the face has a promising appearance. On Brady's vein a considerable amount of ground has been stoped and worked to about 60 feet deep, 65 tons of quartz raised yielded 99 ozs. 13 dwts.; owing to the hardness of the rock and small size of veins it was not deemed advisable to work deeper at present.

The shaft on Major's vein sunk a further depth of 20 feet, and cross-cut driven, striking several veins, but not payable. Small crushings were raised from other veins, all showing good gold in patches, but owing to small size of veins would not pay under present system of working; 10 tons raised from Rinxes' vein yielded 9 ozs. 2 dwts. 9 grs., and a small lot raised by tributors yielded at the rate of 3½ ozs. per ton. A considerable quantity of mullock and refuse quartz was crushed at the company's mill for a low yield per ton, 136 tons giving 25 ozs. 10 dwts. 14 grs. gold. It is now proposed to apply for a suspension of the labour conditions for a term, to arrange a reorganization of the company, with a view of increasing the capital, when it is intended to sink shafts to test the ground at a greater depth. Practical miners agree in the opinion that if the hard rock found in sinking could be got through, a complete change in the character of the veins would take place, and, in all probability, magnificent returns be obtained from this mine.

Following the same line of reef south for half a mile, you come to Grice and Party's lease and block claim, in Big Oakey Creek. Several crushings have been raised on this lease at various depths between 50 to 60 feet, averaging from 15 dwts. to 1 oz. per ton. The last crushing, 28 tons, yielding 41 ozs. 8 dwts. 12 grs., gave between £7 and £8 wages per week per man. About 30 tons more are now at grass ready for the stampers, showing good gold. The rock in this ground is soft, little or no powder being required. The vein varies in thickness from about 8 inches to 3 feet. The same remarks apply to this claim as all others in the neighbourhood, the gold being in patches and best near the surface.

South of this lease is Dunleavey's and M'Dowell's claim. A crushing had been raised on a small leader about 2 inches thick, rock very hard. Four (4) tons crushed yielded 11 ozs. 16 dwts. 8 grs. They are now raising a crushing from a vein 8 inches thick.

Next comes Williamson Bros. claim, adjoining the O. K. Two crushings have been raised, averaging 3 ozs. 12 dwts. 5 grs. per ton. Another small parcel of quartz is now at grass ready for the mill, which is expected to yield 5 or 6 ozs. per ton. Three veins are being worked in this claim, all carrying good gold; but owing to hardness of the rock, and the gold-carrying veins being confined to about 12 feet of the northern boundary, the expense for raising quartz is considerable.

In Mini and Vassalla's claim, the O. K. work has been carried on steadily during the year. 56 tons quartz raised yielded at the rate of 3 oz. 7 dwts. 11 grs. per ton, the last 18 tons crushed yielding 94 ozs. 16 dwts. 17 grs., paying over £8 per man per week, besides 15 cwt. packed stone and specimens sent to the Mint to be crushed and assayed. Three veins are now being worked in the face, averaging between 3 and 6 inches, all carrying splendid gold. Present depth 40 feet. A big vein had been stoped and worked down to about 130 feet deep, with payable results, the last raised from this vein being by tributors—13½ tons yielding 10 ozs. 5 dwts. 18 grs.

Different parties raised small crushings on veins on Surface Hill. M'Kenny and Stone have crushed 8 tons for a yield of 5 ozs. 12 dwts., while Mitchell Bros. had 16 tons crushed for 5 ozs. 6 dwts.

On Whalan's Hill is situated a lease belonging to a Sydney company. A tunnel has been driven a considerable distance into the hill to the south, striking a large unsettled kind of a rubbly vein. 56 tons have been raised and crushed, yielding 21 oz. 10 dwts. 8 grs. Result of last crushing 5 dwts. 3 grs. per ton. Not being payable work has been suspended.

At Razorback Messrs. Julius Wannick & Co. hold a lease of 5 acres. Work has been carried on steadily during the year. The shaft is now down about 80 feet. The antimony ore was struck at 10 feet from the surface, which was worked from that to 30 feet, and 20 tons sent to Sydney, which did not pay working expenses. From 70 to 80 feet in the shaft the vein is much better defined, and is from 14 to 16 inches thick and of a much better quality, it yielding about 1 in 4 of antimony, and the remainder in quartz, in which there is gold in small quantities. 10 tons of ore has recently been sent to Sydney which has proved payable.

The following miners' rights and business licenses have been issued during 1877:—Miners rights, 487; business licenses, 26; and the gold sent by escort amounts to 4,995 ozs. 12 dwts. 20 grs., by other means, 331 ozs. 6 dwts.

TAMBAROORA AND TURON DISTRICT—IRONBARKS DIVISION.

(*M. Hanley, Mining Registrar.*)

I HAVE the honor to report the following particulars touching the mining industry in this division, in accordance with the request contained in your letter of the 10th instant.

At Ironbarks, Stony Creek, and Muckerawa, which embraces a radius of about 5 miles there are as many as twenty-six quartz reefs which have been worked—some of which are now being worked, and some were not being worked at the time I collected the information, but have been more or less during the past year. In order to comply with your request to describe the various reefs, I have prepared the information in the form of a return, which I enclose herewith. One of these reefs is now much spoken of by the miners, and its returns justify the attention it is engrossing. It first came into notice last May, when a Frenchman named Numa Chadeysson got a prospect in a shallow pot-hole which led him on to the reef. As the celebrated boat-race was about that time being contested by Messrs. Trickett and Rush, the reef was called Trickett's—hence its name. The reef is 3 feet thick; Chadeysson is on quartz that has continued to yield 2 ozs. per ton, and M'Dowell's party adjoining are getting quartz at a depth of 40 feet that gives a little over 3 ozs. per ton. This gold is worth £3 19s. per oz.

The return which I have already alluded to will give you a very fair average as the yield per ton obtained this year, also the distance each reef has been prospected, the thickness of stone, and the depth attained on each line.

The majority of the reefs on this field have been very rich from the surface to a depth of from 20 to 40 feet, but as a rule the gold has not been found to continue in the stone to a greater depth than from 40 to 60 feet. At that depth a barren stone is met which up to the present time has never been bored through. In no instance has a perpendicular shaft been sunk to a depth of 150 feet. As an instance of this want of energy, I would mention that a certain party of two men some time ago—about 12 months—found a new vein or reef at Splitter's Gully, Stoney Creek, which gave them 9 ozs. to the ton; this vein ran out and has never been sought for since.

The Perseverance Reef is the only one at present opened in which the gold has not run out. The shaft is 104 feet deep. The last crushing from this reef, and from the shaft in question, yielded 3 ozs. 15 dwts. per ton. After many months of idleness work has been resumed in this shaft.

I believe in the course of time, when energy and capital are brought to bear on the reefs in this district, that there are many of them that will prove payable at a greater depth than has yet been attained.

During the late mining mania much capital was recklessly expended; in nearly every case the companies were not managed by practical men. These managers, with all the money they spent, added nothing to the knowledge that is gained by deep sinking, so that it may be said that the reefs in this locality are still untested, in comparison to the great depth attained in other places.

The numerous gullies and flats of from 2 to 10 feet deep of alluvial ground would give handsome returns for ground sluicing, but owing to no permanent supply of water being available these operations cannot be carried out. On the Macquarie River there are miles of country on either side of the river, alluvial flats from 5 to 20 chains wide, and having from 30 to 80 feet in depth, with about 30 feet of wash-dirt; water supply is the only thing wanting to make miles of this country one of the most profitable fields in New South Wales. At present there are only a few parties of Chinese who have water-wheels working on the river bank.

The alluvial mining in this division is in a languishing condition; there is nothing fresh in this class to report. The men principally to be found at this class of work are old fossickers and Chinese. I have failed to elicit any information from the Chinese. There are, however, several parties at work in the 1st, 2nd, and 3rd Hills, and also in Madman's Gully, Ironbarks.

I enclose herewith the only returns that have come to hand, although I sent out a large number. From them it will be observed that Mr. William Scott's crushings for the year were 1,174 tons, which returned 1,156 ozs. Mr. Boehme crushed 1,689 tons for 701¾ ozs. Mr. C. R. Styles crushed 498 tons for 394 ozs. Mr. Joseph Allen, of Muckerawa, was idle for seven months of this year for want of water; he was only able to crush about 300 tons, which gave about half an ounce per ton. He has informed me that he has now two months supply of water, with plenty of stone to crush.

I can only submit one return of the wash-dirt puddled and the cement crushed, as the others have not been sent in. From it it will be seen that 1,403 tons have been puddled, which yielded 199 ozs. 8 dwts. gold, and 271 tons of cement crushed gave 108 ozs. 11 dwts. gold. 160 miners' rights and 23 business licenses have been issued during the year; but these numbers do not represent the number of miners, as many have not taken out miners' rights, especially the Chinese, who appear wretchedly poor.

As the railway works are now being pushed on through Stoney Creek and Ironbarks, a great many of the miners have taken employment on the line, where there seems a certainty of wages being obtained. The Railway when finished will afford such facilities for visiting the Ironbarks that no doubt the reefing industry will be improved.

As the last gold escort has left here for the year, I am in a position to give the quantity of gold which has been consigned with the gold receiver for transmission by escort during the year; but I am unable to give the alluvial separate from the reef gold, viz.,—2,728 ozs. 13 dwts., which is worth on an average £3 15s. per ounce. A good deal of it is worth £4 per ounce, and hardly any of it is as low in value as £3 10s. per ounce. A quantity of gold has been taken privately and sold to the Banks at Orange and Wellington, which cannot appear in this report, and which will go to augment the returns from these places.

There are four quartz crushing machines in this locality, viz., two at Ironbarks, one at Stony Creek, and one at Muckerawa. They represent in the aggregate 47 stampers, 80 horse-power, and £5,200 in value.

Nine gold leases and six mineral leases have been applied for during the year; but I do not know how many have been granted or taken up, as my appointment is only of recent date.

I have collected a few specimens of stone from the reefs that are now being worked, and shall send them to the Under Secretary if deemed worthy of acceptance.

RETURN of number of Reefs in Stony Creek Division, and their average yield per ton.

No.	Name of Reef.	Distance Prospected.	Thickness of Reef.	Depth attained.	If now working.	No. of Men.	Quantity Stone crushed.	Yield per ton, average.	Average yield per ton, previous to 1877.	Remarks.
1	German Jack	½ mile	12 inches	90 feet	No	...	...	...	12 dwts.	
2	Madman's Reef	½ ,,	12 ,,	60 ,,	No	...	...	...	1 oz.	
3	Perseverance Reef	1 ,,	10 ,,	100 ,,	Yes	6	12 tons	3 ozs. 14 dwts.	2 ozs.	Commencing to work lease.
4	Canadian Reef	1 ,,	15 ,,	60 ,,	No	...	28 ,,	9 dwts.	12 dwts.	
5	Post Office Reef	¼ ,,	18 ,,	100 ,,	No	...	288 ,,	10 ,,	15 ,,	
6	Trickett's Reef	100 yards	3 feet	40 ,,	Yes	16	180 ,,	2 ozs. 15 dwts.	Only found, May, 1877.	2 leases and 2 claims.
7	Poor Man's Reef	¾ mile	2 ,,	90 ,,	Yes	14	403 ,,	15 dwts.	1 oz.	2 leases.
8	Monk's Reef	1¼ ,,	12 inches	95 ,,	Yes	16	422 ,,	1 oz.	1 oz. 5 dwts	2 claims.
9	Ginger Reef	400 yards	2 feet	80 ,,	No	...	340 ,,	2½ dwts	9 dwts.	
10	Stringy-bark Reef	½ mile	9 inches	70 ,,	Yes	16	217 ,,	17½ ,,	14 ,,	
11	Bee-hive Reef	200 yards	12 ,,	96 ,,	Yes	3	76 ,,	15 dwts	15 dwts. to 1 oz.	
12	Swallow's Nest Reef	500 ,,	9 ,,	52 ,,	No	...	...	...	1 oz.	
13	Bonsworth's Reef	½ mile	8 ,,	40 ,,	No	...	60 ,,	9 dwts.	½ ,,	
14	Chinamen's Reef	200 yards	9 ,,	60 ,,	No	...	...	...	1 ,,	
15	Prince William	½ mile	12 ,,	80 ,,	Yes	4	10 ,,	1 oz. 4 dwts	15 dwts.	
16	Redfern	½ ,,	14 ,,	50 ,,	No	...	...	...	16 ,,	
17	Great Britain	¾ ,,	4 feet	60 ,,	Yes	13	428 ,,	14 dwts	6 ,,	
18	Graham's Reef	¼ ,,	4 inches	30 ,,	No	...	24 ,,	9 ozs.	New find	Run out.
19	The Chump Reef	½ ,,	16 ,,	70 ,,	No	...	160 ,,	2½ dwts	14 dwts.	
20	Splitters' Gully	¼ ,,	11 ,,	50 ,,	Yes	2	70 ,,	10 ,,		
21	Reef near Stony Ck.	¼ ,,	8 ,,	40 ,,	Yes	6	66 ,,	1 oz. 15 dwts.		
22 to 26	Five Reefs at Muckerawa	2 chains each	18 inches average	60 ,,	Yes	50	300 ,,	½ oz.	...	Large quantities of stone ready for crushing now.

MUDGEE DISTRICT—GULGONG AND HOME RULE DIVISIONS.

(*Alfred F. H. Stephen, Mining Registrar.*)

OWING to the continuance of the drought, mining matters in these divisions have not improved during the year 1877. Many experienced miners are willing to prospect in the large area of supposed auriferous country in this district, but the want of water and grass renders it almost an impossibility. More attention is being paid to the deep wet ground than formerly, but there is still the great want of capital which has so long crippled mining enterprise in this part of the Colony.

A 25-acre lease has been taken up on the Black Lead, which it is supposed will turn out well, as the lessees have means and the necessary machinery.

Several leases have been taken up on the Star of the West Lead, the prospectors have got gold, but the company has been compelled to suspend operations as they have not sufficient funds to work the mine to advantage. It is, however, confidently believed that a payable lead exists at or near the old Star of the West and Moonlight Leads.

At Home Rule a mine known as the Red White and Blue is being worked with considerable success; it is in private property, but is at the south end of the Davie Buchanan Lead. This, in the opinion of many, convinces them that the old Davie Buchanan will yet turn out a grand success.

Mining generally is very dull, as most of the old ground is getting worked out, and new ground cannot be prospected owing to the reason already stated. 11,461 ozs. 8 dwt. 11 grs. have been sent from Gulgong per escort during the year.

During the year I have issued 511 miners' rights, 97 business licenses, and 2 mineral licenses.

MUDGEE DISTRICT—MUDGEE DIVISION.

(*Francis S. Isaacs, Mining Registrar.*)

IN submitting my Annual Report for the year 1877, I regret to say that both quartz and alluvial mining is almost at a complete stand-still throughout my division.

This depression is owing to the long and continued drought, the creeks and water holes where mining enterprises are carried on being quite dried up.

There is no lack of enterprise amongst the miners and inhabitants in the district, and no doubt as to the rich auriferous nature of the ground of a great portion of it.

Should we be favoured with a plentiful supply of rain, I have every hope of being enabled to furnish a report of a very satisfactory nature at the close of the year.

Alluvial mining, with the exception of some little fossicking in the early part of the year, has been confined to the Log Paddock, which is private property.

The British Lion Gold Mining Company is the only quartz mine now worked in my division, but I have ascertained they are getting very small returns.

The number of miners rights' issued by me during the past year is 65.

MUDGEE DISTRICT—HARGRAVES DIVISION.

(*Thomas O'Brien, Mining Registrar.*)

Alluvial.

DURING the past twelve months there is little or no change in mining matters to report on in this division. The number of miners, both European and Chinese, has decreased considerably in 1877 in this division, owing to the scarcity of water occasioned by the prolonged drought. I have no doubt that as soon as sufficient rain falls to cause the rivers and creeks in this division to flow, there will be an influx of diggers, as with plenty of water diggers can make good wages on this field still.

Quartz.

Nothing fresh to report on from this division, as there were no quartz reefs worked during 1877.

MUDGEE DISTRICT—WELLINGTON DIVISION.

(*F. Marsh, Mining Registrar.*)

HAVING only very recently received the accompanying returns, I have now much pleasure in making my report for the year 1877, on the state of the gold-fields in the Wellington Division under my charge:—

At the time of making my last report, dry weather and consequent want of water had previously prevailed for a very considerable time; since then and up to within the last week (when the district was visited with heavy rain) little or no rain of any consequence has fallen. The consequence of such an unusually severe and protracted drought has therefore had a most damaging effect on the working of the gold-fields and materially diminished the amount of gold won—alluvial operations having mostly to be abandoned for the time.

It will be observed that of the two companies who are working their ground by machinery, one of them, the Kaiser, through want of water, worked only five or six weeks during the year. This I need hardly explain represents a very large decrease in the quantity of gold which under more favourable circumstances would have been won. And by roughly comparing the returns from the two mines, the Mitchell's Creek Mine being better supplied with water, it will be seen that this decrease represents something over 2,000 ozs.

The very heavy rains which have fallen during the past week will however, I anticipate, give a fresh impetus to mining generally, and encourage the alluvial miners particularly to fresh exertions. The latter class of miners comprise both Europeans and Chinese. Profitable employment is obtained in many parts of the district, I may mention particularly the Black Mountain, Jaw Bone, Bonada Creek, Head of Woolamin, Euingala, Gunner's Dam, &c., and from where in ordinary seasons a very considerable amount of gold is returned.

From all sources during the year 1877, the amount of gold transmitted from Wellington by gold escort was as follows :—

	ozs.	dwts.	grs.
Quarter ending March	725	3	1
,, June	661	10	5
,, September	878	14	1
,, December	862	12	2
Showing a total of	3,127	19	9

By deducting the amount of gold obtained from the two companies' works, as mentioned in the accompanying returns, viz., 2,388 ozs. in all, from this total, a balance is shown of 739 ozs. 19 dwts. 9 grs. which have been obtained from the alluvial workings, and which, considering the state of the past season as already remarked upon, cannot but be considered as favourable to the district. I may here add, that a large amount of the stuff comprising many hundreds of tons which has been passed through the battery of the Kaiser Co. since it commenced operations, contains such a large percentage of copper that it is all being reserved to be treated at some future time, the results of which will be communicated to you in due course. I may further add, that since my last report no other minerals of a character different to those already mentioned have been discovered.

Comparing my present report with the one for the past year, I cannot but feel that the mining interests of this division, notwithstanding the most adverse circumstances, have flourished to a very fair extent ; and should the heavy rains which have fallen within the last few days be a break up of the most severe drought which has been experienced for very many years past, and should an ordinary quantity of winter rains follow, the past depression will give place to more hopeful feelings and increased energy on the part of the miners ; and I am sanguine enough to believe that the present year will far exceed in its results those of the past two years.

LACHLAN DISTRICT—FORBES DIVISION.

(*F. S. Osborne, Mining Registrar.*)

IN transmitting this my third Annual Report of the mines in my division, I would state, that they have not been in such a flourishing condition as they should have been, but this is owing to the bad seasons that we have experienced in this district, which has so impoverished the miners, that they have been obliged to turn their attention to other occupations than mining to obtain a livelihood ; therefore, no prospecting for gold has been done, but I have no doubt, now that the seasons are improving, that prospecting will be carried on with more vigour.

Great complaints are made in this division at the quantity of land that is fenced in by parties who have neither miners' right or business license, which prevents miners who would do so from working the old leads.

Quartz Mining.

The shaft of the Foster's Reef Gold Mining Company at Cudgellico Lake is now down 170 feet, the last level having been driven at a depth of 140 feet. An this level the quartz was in some place 12 feet in thickness, but the gold-bearing stone only averaged about 18 inches, and consisted of 2 shoots each about 30 feet in length ; this stone has a strike north of 45°, and in underlay is nearly perpendicular. It is well formed, having clearly defined walls with a clay flucan on the eastern side which contains gold. The gold is coarse, and the lode itself has all the appearance of permanency.

There is comparatively little known yet of the actual value of the mine, as up to the last few months it has not been paying its working expenses. Since that time the stone has gone about 1¼ oz. to the ton, but even at that it will take a long time to recoup those interested, who have already expended £20,000 in cash on it. About £4,000 has been spent in the erection of machinery, which consists of a 20 horse-power horizontal engine for winding and pumping, the water being taken up through 8-inch lifts, also a 17 horse-power horizontal engine, driving a battery of 12 head of 6 cwt. stampers (revolving). This machinery is all of the very best description.

The company purpose opening the next level at a depth of 200 feet, in order to further test the value of their ground.

Outside of their ground, with the exception of a few shafts sunk and not driven, no effort has been made to trace the lode north or south, although likely country exists on either side. There are no alluvial workings in this part of my division.

Strickland's Reef, near Forbes.—This mine at the commencement of the year was not working, having been held in reserve for six months for the purpose of obtaining machinery. At the expiration of that time, the party not agreeing, three of them left ; the others then re-marked the ground, and had it re-surveyed, and have since continuously worked the same, with the following results :—They have raised 100 tons of quartz : gold won from same, 150 ounces ; value of said gold, £582 2s. 6d. ; average value of gold won, £3 17s. 10½d.

per ounce. The depth of their shaft is 150 feet, the deepest level 150 feet, width of vein 1 foot to 6 feet, underlay to the east with a strike north and south. They have a very large quantity of pyrites, but have no mode of saving or treating same. This would be a very valuable mine if capital were brought to bear upon it, and machinery erected upon the ground, as the vein in parts is very wide and contains gold, but not sufficient to pay with the present appliances. Being 8 miles from any crushing plant, at present they only take about 8 inches of the vein, which contains gold freely, and is very free from other minerals, as will be seen by the value given by the Banks for the gold per ounce.

There were two extended quartz claims taken out on this line of reef during the year, and which were worked for a short time but were ultimately abandoned, the carting and crushing being so expensive that they were obliged to leave until they could earn sufficient money to enable them to further test the ground.

Woods and Schiller's Quartz Lease, on the South Lead, Forbes, was worked for a short time, at the commencement of the year; but has since been cancelled for the non-fulfilment of labour conditions. On this lease they were very much troubled with water, which prevented them from following the lode to any depth. This lode was very rich in parts. Specimens from the same line of reef were sent to the Department of Mines for exhibition in the Museum, some time back, by Messrs. Raynor & Rees, who were working the adjoining claim to this lease, but who have since abandoned their ground being unable to overcome the water.

The other reefs in my division are at present idle, from causes which are explained herein.

Alluvial Mining.

THE principal alluvial mine in my division is at the Bald Hills, near Forbes, being the amalgamated claims of Matheison and party. This claim has not been working continuously during the year, having, at its commencement, been flooded out, thereby causing great delay for repairs, &c. The depth of the shaft is 200 feet, with a width of wash-dirt 35 feet. They work the ground by means of a whim, and have a puddling machine on the claim, the water from the shaft being used for puddling the wash-dirt. They have raised 220 loads of wash, and gold won from same 195 ozs. They state that now the claim is in working order, that it is paying them good wages, and that they are perfectly satisfied with their venture.

Two other extended claims were taken up on this lead during the year; but have since been abandoned on account of not being able to overcome the water, and having run out of funds.

There is a party being formed, in Forbes, to prospect this lead about a mile from the present workings.

Victoria Lead.—On this lead a party of six men have an extended claim, and were sinking to find an old shaft that was sunk some years ago and good gold obtained, but from some cause abandoned. The party, when about 30 feet down, found that they were too far south-east, and had to come up and take down the two blocks left. The taking of these down caused the whole of the frame and earth to fall in, half burying one of the miners at work below at the time, and severely injuring him. They then applied to have their claim held in reserve for three months, which was granted. They are now about to commence work again.

Caledonia Lead.—A lease of 2 acres has been applied for on this lead, and a party has been formed to work the same, and are now preparing to start operations.

South Lead.—There are two 25-acre alluvial leases on this lead; the lessees are endeavouring to float them into a company; there are great difficulties to contend with in this ground, there being a great extent of drift to go through requiring boxing, also an immense quantity of water; this ground will require large capital to work it. Gold in payable quantities is known to exist, but the expenses in former times were so great that the occupants had to abandon their claims. No work has yet been done, although the leases have been issued to the applicants.

Old Mathieson's Lead.—About 200 loads of tailings and headings from this lead have been washed by Walcott and another, from which they obtained about 90 ozs. of gold.

Mr. Callow has put through his crushing machine at Forbes 500 tons of quartz and tailings from the various leads and reefs in my division, with an average of 2 to 3 dwts. to the ton; he also states that there is plenty of stuff worth crushing, but that it is on private property. Land is now being alienated, to the great loss of the miners.

There are no minerals or metals other than gold to report upon in my division.

LACHLAN DISTRICT—CARGO DIVISION.

(*R. Hutton, Mining Registrar.*)

The alluvial mining in this division is still confined to Gum Flat, the yield from which has not been so good as in former years. Three claims are still at work on the perpendicular veins; none of the shafts have reached a greater depth than Odgers and parties, which has remained at 345 feet for the last three years. With the exception of a slight falling off in the yield of gold, there has been no alteration in these veins since last reported upon. The main or granite bottom has not yet been reached.

Two claims are working on the flat bottom at a depth of 60 feet, the yield of gold from which is about the same as that from the veins, viz., 4 dwts. to the ton.

During the year about forty men have been employed in this branch of mining (some of whom are fossicking); 5,000 tons of wash-dirt have been raised, and about 1,000 ozs. of gold obtained.

The scarcity of water has somewhat retarded mining operations during the year; there is scarcely enough in the place now to try prospects.

In reefing, the following leases have been at work during the year, viz., the Ironclad Gold Mining Company; Ironclad Reef, D. L. Bayliss; No. 1 North Ironclad Reef, Elder and party; Victim Reef, Brideoake and party; Blue Jacket Reef, near Canowindra.

The Ironclad Company were steadily at work during the first ten months of the year. Work has been suspended since the 1st of November, there being no water for crushing purposes. The main (or No. 1) shaft has not been sunk any deeper during the year, its present depth being 360 feet, the deepest shaft in the division. Since the stoppage a contract has been let to sink No. 2 shaft an additional 50 feet, which is now about completed, and the depth attained 150 feet. The vein sunk upon shows pretty good gold. When in full work, the company employs seven men at the battery and furnace and eighteen at the mine.

I have not been able to ascertain the exact quantity of gold won by this company during the year, there having been a change in the management, the present manager, Mr. T. J. Curtis, being unable to inform me what was obtained previous to his taking charge; he, however, very kindly furnished me with a statement of the results during the six months under his management, and by averaging the former months I arrive at the following for the year, which, I think, is pretty correct, viz.:—

	Tons.	Yield.
Quartz crushed	1,820	657 ozs.
Buddle stuff treated	416	1,414 „
Total yield for the year		2,071 ozs.

On No. 1 North Ironclad Reef, the property of D. L. Bayliss, two men are continuously at work sinking; the present depth is 92 feet, but nothing payable has been struck as yet. This gentleman certainly deserves success for his enterprise.

Elder and party, on the Victim Reef, were steadily at work during the first half of the year; they had a crushing of 12 tons, which yielded 14 ozs. of gold. They have obtained a suspension of the labour conditions of their lease to enable them to form a company to work the ground.

A company has been formed to work Brideoaker, and party's lease, on the Blue Jacket Reef, near Canowindra; they have lately had a small trial crushing, the result of which is not exactly known, but it is said not to be payable.

There have been no other mining operations in the division during the year; none of the copper leases have been at work.

There were 74 miner's rights, 3 business licenses, and 1 mineral license issued during the year.

The number of miners engaged were:—

Alluvial	40
Quartz	35
Total	75

Quantity of gold won was:—

Alluvial	1,000 ozs.
Quartz	2,100 „
Total	3,100 ozs.

LACHLAN DISTRICT—GRENFELL DIVISION.

(*W. F. Parker, Mining Registrar.*)

I HAVE the honor to forward my report in reference to mining in this division of the Lachlan Mining District during the year ending on the 31st December, 1877.

I regret that I am unable to report any marked improvement in the prospects of this once famous gold-field.

In comparison with the year 1876, there appears a slight increase in the total production of gold, but this is in consequence of the returns from one claim (the Consols Gold Mining Co.); without this the yield would have been less than that of the year 1876.

During the past year only 67 miners' rights and 26 business licenses have been issued by me. I notice that during the last year very few but practical miners have taken out miners' rights; formerly this used not to be the case.

In quartz mining only 10 claims are now working out of the number of about 50 that were formerly worked; and in alluvial only 6 claims have been worked during the year past. No doubt the scarcity of water has prevented many alluvial claims from being worked (the drought having severely afflicted this district during the past two years).

In order to give you an idea of what is being done on this gold-field, I will proceed to furnish you with a few particulars respecting the various claims in this division (both alluvial and quartz):—

Homeward Bound Reef.

James Tuff and party, now worked by three men. Depth of old shaft 300 feet, width of quartz vein 2 feet 6 inches. No work done in this claim during the year 1877.

Victoria Reef—Main Lead.

Allsop and party, worked by three men with windlass and rope. Depth of deepest level 70 feet, width of vein 1 to 3 feet. 220 tons of stone raised in this claim during year 1877, yielding an average of 4 dwts. to the ton, £3 18s. per ounce being obtained for the gold.

Lucknow Reef.

There are two claims on this reef just commenced to work, with two men in each claim. No work done during 1877.

Welcome Reef.

Allen and party, worked by four men, with windlass and rope. Depth of shaft 60 feet, width of quartz vein 16 inches. Raised 60 tons stone in 1877, yielding 60 oz. of gold, averaging £3 15s. per ounce.

Enterprise Reef.

Pettit and party, a 3-acre lease in 6 shares. Five men now at work. Depth of shaft 320 feet, now being worked at 200 feet level. Raised 140 tons of stone in 1877, which went 1 oz. 6 dwts. to the ton, realizing at rate of £3 17s. per ounce.

No. 2 Welcome Reef.

Dunn and party, by three men, with windlass and rope. Depth of shaft 185 feet, working at 130 feet level, width of quartz vein 2 feet. Raised 15 tons stone during the year 1877, only commenced work in the month of November, the gold realizing £3 15s. per ounce.

Consols Gold Mining Company, O'Brien's Hill.

A 12-acre lease, sixteen men now at work. Depth of shaft 720 feet, depth of deepest level 500 feet, average width of vein 3 feet. 893 tons of stone raised in 1877, yielding 605 ozs. 6 dwts. 11 grs., being of the value of £2,299. The greater portion of the above gold was obtained by miners working on the tribute system.

ALLUVIAL CLAIMS.

Seven-mile.

Doyle and party, three men, worked by windlass and rope. Depth of shaft 90 feet, depth of wash 6 inches to 3 feet. Raised 80 loads of dirt during the year, which yielded an average of 10 dwts. to the load; price of gold £3 15s. 6d. per ounce.

Bourke and party, three men, worked by windlass and rope. Depth of shaft 90 feet, depth of wash 6 inches to three feet. This claim was only worked for one half of the year, and very little gold was obtained, the yield being from 7 to 9 dwts. to the load.

Quandong Gully.

Storen and party, two men, worked by windlass and rope. Depth of shaft 145 feet, depth of wash 6 to 7 inches. Got no gold during year 1877; were working for about two months. The wash-dirt now being raised yields 5 to 6 dwts. to the load.

Dodd and party, four men, worked by whip and horse. Depth of shaft 200 feet, depth of wash 1 to 2 feet. 325 loads of dirt raised in 1877, yielding 75 ozs. of gold—from 5 to 7 dwts. to the load.

Archer and party, four men, worked by whip and horse. Depth of shaft 150 feet, depth of wash-dirt 1 to 2 feet; average yield of gold 6 dwts. to the load.

Milkman's Gully.

Peters and party, two men, worked by whip and horse. Depth of shaft, 150 feet, average thickness of wash-dirt 1 foot. Raised 150 loads of wash-dirt, yielding 37 oz. of gold, being from 4 to 5 dwts. to the load.

LACHLAN DISTRICT—YOUNG DIVISION.

(*J. R. Edwards, Mining Registrar.*)

I HAVE the honor to submit my Report of the working of this gold-field for 1877. I have delayed it till the last moment, in the vain hope that I would obtain some further information from the miners. I handed a number of the necessary forms to the Chairman of the Miners' Protection Association, and I distributed others among the miners and persons interested in mining matters; but four only have been returned to me, and these contain little information. The fact is, as previously pointed out by me, gold mining on this field must depend upon the supply of water by rainfall; and as the past year has been one of unusual drought, little sluicing has been done. There was a rush near Wombat during the year, where some new ground was struck; and the yield from that locality has helped to swell the aggregate, yet there is a considerable falling off on last year's returns. The amount of gold purchased in this district during 1877 was 818 oz. 17 dwts. 6 grs., which is a decrease on the returns of 1876 of 202 ozs. 1 dwt. 6 grs.

For 1876 I gave the average yield as 12 grains of gold to the ton of dirt. The few papers for 1877 now before me give the average of 6 grains to the ton only. In any case, this must be arrived at by mere guess, as the gold is extracted in the most primitive and slovenly manner, the earth being thrown into a race or ground-sluice, and the water allowed to rush over it, the gravity of the gold being wholly trusted to prevent its being washed away. When the water is turned off or ceases to run, the residuum is collected, cradled, and panned off. There are no definite means of ascertaining the quantity of earth operated upon; and it is quite clear that a large quantity of fine gold is lost, as the counteracting forces of the rushing current, and adhesion of surrounding materials, must to a great extent overcome the gravity of the fine gold dust; moreover, the quantity lost will vary under different circumstances.

The Burrangong Gold Mining Company have some extensive works in course of construction. There is a drainage tunnel 2,800 feet long, and 4 feet 6 inches high, closely timbered, and reported to be worth £2,000.

The miners' rights issued in 1877 numbered 253; business licenses, 24; mineral licenses, 3. There is an increase of 1 in the miners' rights on the previous year. There was no result from the mineral licenses. There have not been any quartz workings during the year.

SOUTHERN DISTRICT—BRAIDWOOD DIVISION.

(W. F. Robertson, Mining Registrar.)

I have the honor to report, that nothwithstanding that mining operations in my division, like all others in the Colony, have been retarded so very seriously by the last three years' excessively dry seasons and the consequent scarcity of water for sluicing purposes, the yield of gold during the year 1877 shows a slight increase upon the previous year's returns. This in the face of the fact that the number of men employed in mining was considerably diminished, and a greater number of claims were idle for want of water to work them, proves that the richness of the gold deposits on the banks and in the neighbourhood of the Shoalhaven River, from whence the increased yield comes, are far from exhausted; and on the contrary this gold-field would appear to be but in its infancy, and only now developing in a small degree its vast gold-producing resources, and there is ample reason for the belief that the gold-fields on this river will yet prove the source of wealth to the district and this part of the Colony.

All of the more extensive claims, and all claims dependent for their water supply upon the larger creeks (which have not been known to fail before for the last twenty years), have ceased to be worked many months since for want of water. Notable amongst these is the Shoalhaven River Sluicing Company's Claim, which employed a large number of miners, and was worked by means of a race some 25 miles in length constructed at a cost of about £4,000. This claim has ceased to be worked in consequence of the failure within the last few months of the water-supply from Reedy Creek.

At Limestone Creek, near the Shoalhaven River Sluicing Company's Claim, claims were taken up and worked on the co-operative system fairly profitably so long as the water-supply lasted, but I think all now have been compelled to give up for want of water.

There have been some very good yields of gold obtained from claims recently opened on the banks of the river, near Nerriga, where the wash-dirt is obtained at the tops of the high banks from 25 to 30 feet above the bed of the river, and is thrown down by means of shoots to the water below where it is sluiced. These are also worked on the co-operative system, and in one of them (Walsh and party, of seven men) a tramway is being laid at considerable cost to convey the wash-dirt to the shoot, and a large water-wheel and pumps are being erected for the purpose of raising the water required for washing the dirt; by this means a great saving of labour will be made, and it is hoped a larger return of gold gained.

The several claims at and near the Bombay Crossing-place on the river have continued to give fair returns, and have well paid the several miners employed upon them, as also have all the other claims, so far as I have been able to learn, on the river. At Potato Jack's Point, a large claim was recently taken up, and all the necessary dams, races, sluices, &c., have been constructed for the purpose of successfully working the claim, but I am not aware if any return has as yet been obtained, though the holders of the claim are sanguine of its ultimate success.

At the Yellow Springs, near Corang, there are several parties of miners employed on ground-sluicing claims, and very fair returns are obtained by them.

The Jembaicumbene Gold Field has suffered more seriously from the effects of the long continued drought, and the Jembaicumbene Creek, the only source of water-supply on this field, has now nearly ceased running. But there are still some Europeans holding to it in the hope of being rewarded by success in the end; and the Chinese, who appear contented with a mere subsistence, and live in miserable huts, also stick to this field, and get a hard living by small workings in the creek, &c.

Jacqua.

Since the resignation of the Mining Registrar at Spring Creek, some two years ago, this division has been without a Mining Registrar, and the miners who continue to work there are compelled to come to me at Braidwood for all the purposes of applications, registrations, &c., although I have not looked upon it as a part of my division, and I have not been able to gather all the information requisite to give a full report of its workings. I believe, however, that there are about twelve Europeans and twenty Chinese still at work there on the co-operative system, and making good profitable returns from it. The yield of gold, I think, may be estimated at about 400 ozs. during the year, though I have not had the means to ascertain what the actual yield was. There is little machinery in use there now, the workings are all done by means of races, dams, water-wheels, pumps, sluices, and sluice-boxes, of a total value of (say) £500. The deposits worked now are all alluvial, and the gold is obtained, by means of ground-sluicing. The quartz reefs have long since been abandoned, in consequence of the want of machinery to successfully work them, and the absence of capital to meet the large outlay and expenditure requisite to keep a large undertaking of the kind going.

The yield of gold for the year from the respective fields has been estimated as follows, namely:—Shoalhaven River, 759 ozs., and Jembaicumbene, 281 ozs.; and the value per ounce—Shoalhaven River, £3 15s.; Jembaicumbene, £3 13s. This does not include the estimated yield of 400 ozs. from Spring Creek and Jacqua, which was worth about £3 15s. per ounce, but is not in my division.

SOUTHERN DISTRICT—ARALUEN DIVISION.

(*E. F. Carlisle, Mining Registrar.*)

THE past year has not been an eventful one in this division,—no new discoveries and no rich finds, although some of the claims have been on better gold, as evidenced by the increased returns being, as stated by the gold-buyers, over 5,000 ozs., which is an excess of nearly 1,000 ozs. over the quantity purchased by them in the previous year. The prospects seem to be brighter also for the coming year.

From one of the returns enclosed (that relating to the Crown Sluicing Company) it will be seen that the yield per ton has been very small—3 grs. only. It must be borne in mind, however, that the stripping was very light—about 3 or 4 feet—and the wash-dirt frequently from 16 to 20 feet thick, which greatly helped to make such poor ground pay.

Two of the deep stripping claims have discontinued work on account of poor ground and other difficulties; but one of the parties has recommenced near its old workings, on what is thought to be good ground.

The long-continued drought has interfered very much with the returns of the ground sluicers. Rain would be acceptable to them, and even those working in deep ground do not fear its effects so much as they once did, as a great deal of the drainage is now accomplished by means of gravitation instead of by the former expensive mode of steam pumping on the surface. The races for the purpose are costly, as they have to be boxed with sawn timber, and require about £2,000 a mile for their completion; but the race once made there is an end of the outlay.

The only quartz mining has been at Bell's Creek, where there are a few tons of stone, said to be rich, waiting for crushing.

The issue of miners' rights continues to increase.

SOUTHERN DISTRICT—MAJOR'S CREEK DIVISION.

(*John Heazlett, Mining Registrar.*)

IN submitting this, my Report for the Year ending 31 December, 1877, I regret that I am not in a position to give a more favourable account of the mines within my division. After making my last tour for the purpose of gaining information, I am obliged to state, that in regard to alluvial mining, anything in the shape of progress is only conspicuous by its absence.

Major's Creek.—The upper diggings has the appearance of being deserted, except that Messrs. Cahill, Archer, and Co., are driving a tunnel under the road leading from Elrington to Balallaba, and so far the work appears to be of a substantial character. This is being done for the purpose of working the ground above the road. What is known as Cahill and Archer's lease, on the lower part of the creek, there is nothing to notice.

Jembaicumbene.—This field shows no sign of progress, only a few European claim-holders, who would be hard to find—many having gone elsewhere until the rainy season sets in. One or two parties having water can knock out good returns, but all the others depending on water are doing little, and the general cry is, "Can do no good without rain."

A few Chinese, who being loath to give it up, are stripping old blocks left at the time of first working. As to what they are getting I have no idea; and to ask them, I should get for reply, "No savee," or else "Vely poor; no more gole."

Long Flat.—This field is being worked by puddling, and so long as the water holds out in their dams, they (the miners) can earn small wages, as will be seen by looking over the annexed forms; the quantity of stuff puddled during the past year does not come up to what has been put through during 1876. Two causes may be assigned for this. In a dry season water must be economised by puddling less stuff, and if possible get as much gold; and to effect both, deep sinking is resorted to (of course deep sinking here means about 9 or 10 feet) where vein-stuff is reached, and being better than the surface as much gold is often won as if putting through a larger quantity. Again, when they find the surface too poor, they take a turn at deeper ground. The whole flat resembles pig-rooting more than systematic mining. Still the few inhabitants seem to live somehow.

Back Creek.—This place, which at one time was a busy hive, has fallen into disrepute—not because there is no more gold, but in dry seasons there is next to no water, and the creek-bed having been turned over in most places, the adjacent slopes and flats will not support miners when there is no water, and to divert some from the creek will not pay, as already a race has been cut from here into the Jembaicumbene, and all that could be taken from the creek at a higher level would not be worth the trouble, as when water becomes scarce former rights must take precedence. Another drawback is that the bottom is rocky and very uneven, and gold being fine miners require Job's patience to enable them to clean up. Major's Creek, Long Flat, and Back Creek—taking both hills, hollows, and flats—would pay small wages with a constant supply of water, and lacking this a bare living cannot be obtained, except in a few instances.

Quartz Mining.

Although little progress has been made in this direction, I am glad to say that were it not for a few crushings having been pretty fair my report would be but a dark picture. The tabular form herewith will show what has been done on the new line on Red Hill, and also the result of a few crushings from other localities which gave no returns to the producers. This new line is nearly done up—only one or two parties now remaining—narrow leaders will not pay for going through rock and water, therefore when both have been struck the miner must also strike for higher pay.

Dargue's Old Reef, at Spring Creek—a tributary of the Old Major's—has been worked for the past seven or eight months by a party of twenty-four working shareholders, besides some eight or ten hired hands. This party have not done done much as yet; nevertheless a change for the better took place a few weeks back, and as if to inspire them with fresh courage, fortune smiled upon them the week preceding Christmas, by turning out a cake of 54 ozs. retorted gold. It may be said that this extensive mine is only in its infancy, "so far as work is concerned"; the surface of it was worked by Dargue & Co. some seven years ago, when reaching the mundic, which puzzled not only the party but many others also, it was abandoned, and since then several attempts have been made with more or less success. Yet, it is believed that much gold is being lost; but as is the case with all large parties, each shareholder is as much boss as the man they elect to fill the office, and no sooner has he concerted his plans than grumbling begins; then a meeting takes place, when the majority rules, and here the manager finds he cannot get on. The same as regards the management at the mill, so that there is virtually no manager, which means little or no progress. The particulars as to depth of shaft, strike, dip, or underlay, &c., &c., will be found on the ticket fastened to the sample forwarded from this mine, of 36 feet wide. The mode of treatment of mundic will be found in the annexed form. This company having refused me the information, I am unable to state the number of tons crushed, the quantity of gold won, and the value of same. The gold from this mine is taken to the Bank at Braidwood, consequently will not appear in my report.

As was the case with all my previous reports, I find it impossible to give a true statement of the exact quantity of gold *won* within my division. Some goes to the Mint, some to Braidwood, and probably a few parcels come in here for sale from without this division.

On the 13th December last, I forwarded to Mr. Warden De Boos, at Braidwood, for transmission to the Department of Mines, a parcel containing samples from various claims, so ticketed that no difficulty will be found in ascertaining form whence they came, &c., &c.

The number of miners' rights sold during 1877 comes up pretty close to that of 1876; and to account for the diminution, I may remark that as Elrington is a township as well as a gold-field, those having their own allotments need not hold the miner's right, and some of those are working on private lands.

The foregoing account of what has been done during the past year does not say much for the prosperity of the miners, and fearing that the Government may take it into consideration that it is time to finish a work already three parts done, viz., finally shut up this field, and send the few who are here to some other miserable place, I shall try and show on what grounds (if any) there is hope for the year of 1878 being more prosperous than the one just gone past.

Although there are no present indications of rain, it may turn out a wet season, in which case the holders of alluvial claims throughout the division will do better than they have done last year.

There is reason to presume that the Homeward Bound party will progress, and if so they will require more hands, and the whole of the shareholders being with few exceptions residents of this creek the money earned will be expended here.

Messrs. Wilson, Stuart, & Co., having their own crushing mill within a very short distance of their mine, which is now about to be started afresh, more hands will be required here; and there is no cause to fear that the mundic in this mine won't pay, provided the gold can be separated from the pyrites, &c., &c. Those two mines are on private land.

On same line, but in Crown Lands,—Field, Heazlett, & Co.'s 8-acre lease is situate. This ground, or rather the first claim on it, was named The Australian, which you will notice in one of the annexed forms. This company is preparing for work, having secured a site for crushing mill, furnace, &c., &c., &c., and are making arrangements for the transit of same from Victoria. A shaft 200 feet deep is down on this mine, so that when the first levels have been put in, a large quantity of stone would soon get on top, and even now there is a large heap of quartz to grass—enough to make a fair start when the machinery has been fully rigged.

Taking all things into consideration, I believe the beginning of 1878 presents a more favourable prospect than did the year 1877.

SOUTHERN DISTRICT—LITTLE RIVER DIVISION.

(*P. James Galway, Mining Registrar.*)

THE rainfall during the past year has been less than even the preceding one; and as sluicing is the chief mode of working on this gold-field, all the races depending on flood-water have been idle, and those taking their supply from the river or creek being at work for short periods only. Consequently numbers of miners have had to seek employment elsewhere, having registered their claims until a more favourable season. Most of the races that had a temporary supply of water paid good dividends, as a few items will show.

Mullaney & Co., 3 men for 25 weeks, 140 ozs. Dunshea & Co., 3 men for 12 weeks, 38 ozs. Bruce & Co., 4 men for 15 weeks, 72 ozs. Jellick & Co., 3 men for 12 weeks, 38 ozs.

The dams at present erected in connection with the water-races are only sufficiently large to retain the water that accumulates during the night, or at most a few days' extra supply; whereas, from the formation of the country, reservoirs to hold many weeks' supply could be formed at a small outlay. The diggings have not yet recovered the stagnation caused by the late mining mania, and which prevents capitalists from investing in mining, no matter how genuine the speculation may be.

There is no gold-field in the Colony that presents a more favourable appearance for the investment of capital than this, both in alluvial and quartz mining; and as can be seen from previous reports, the quartz reefs are almost untouched below the water-level, say from 30 to 50 feet, and at this depth they gave returns that compare with, if not equal, any reefing district in New South Wales.

Two leases of 8 and 10 acres have been applied for on Red White and Blue Line of Reef, but owing to some error in a previous survey a dispute has arisen and the parties only wait the decision of the Mining Department to commence work.

I have supplied the forms to the claim-holders for obtaining the returns of stuff washed and the yield, but only in a few instances have they been filled up or information given.

The Chinese still continue to work the river-bed, and even there the scarcity of water is felt, there being not sufficient to enable the water-wheels to keep down the leakage.

SOUTHERN DISTRICT—NERIGUNDAH DIVISION.

(*W. J. Foster, Mining Registrar.*)

In alluvial mining there have been no discoveries or changes to note. The work, as in previous years, has been confined to the old ground and such pieces of new as were found amongst it.

Quartz: Mount Dromedary.—In the early part of the year gold-bearing quartz was found on the north-easterly slope of Mount Dromedary. The prospectors, the Messrs. Cowdrey, secured to themselves a prospecting claim, and an application to lease 3 acres east of and adjoining the prospecting claim was also made, and 16 ordinary claims, mostly one man's ground each under the Mining Board Regulations, were taken up—all of which, save five, have become forfeited and abandoned for non-compliance with the Regulations.

The prospectors have found gold in payable quantities in their claim. In some few of the abandoned claims some efforts were made to find gold, but not meeting with immediate success, they were (in some cases after a few days, in one or two others after a week or two's trial) abandoned, and some of the claims were not tried at all.

The prospectors have three narrow veins of quartz in their claim, varying from 1 to 3 inches in thickness, highly impregnated with iron, and unusually soft. Their manner of working has been to turn a stream of water along the course of the veins and sluice it off; by this process the free gold is obtained, the uncrushed stone is saved to be operated upon at some future time by the stampers. This system of work is not the orthodox way of working quartz reefs, and they will never be able to reach any depth in that way or know what is the value of their ground below; but considerations of immediate returns have doubtless been the cause of that system of working their claim.

In No. 3 West, a tunnel is being driven to cut the veins at a depth of 70 feet from the surface; when they are reached at that depth a better opinion may be formed of the value of the ground.

It is worthy of remark that a large portion of the gold obtained is what is termed "free gold," and readily got by crushing the stone with shovels and picks, and then sluiced or otherwise washed.

Bumbo.—There has been no work during the year, but the prospecting claim, together with two 10-acre leases, one north the other south, have been let by the proprietors for a term of five years on tribute. The tributors commenced work on the 8th January, 1878.

The year 1878 commences with better prospects for quartz mining in this division than the previous year, and it is to be hoped that the anticipations entertained in reference to the improvement of that class of mining will be realized.

76 ozs. 18 dwts. of gold, the produce of this division, found a market at the Bank in Moruya. I have reason to believe the amount is greater than stated, but I have not been able to get the data to verify it, although applied for by me two weeks since.

SOUTHERN DISTRICT—SHOALHAVEN DIVISION.

(*W. Lovegrove, Mining Registrar.*)

The want of enterprise manifested hitherto in mining matters has lately undergone a sudden change. The water-wheel at Yalwal intended for quartz crushing having proved inefficient on completion, Mr. M'Arthur at once purchased a 5-stamp steam battery, and the first crushing of 57 tons turned out 60 ozs. of retorted gold. A claim on the eastern bank of Dangera Creek, belonging to West and Harvey, then submitted 17 tons of the strippings and surface stone, and were rewarded with 28 ozs. of gold. Meantime Mr. Mison had erected a 5-stamp battery, and operated on 20 tons of stone from a third claim, with a result of 18 ozs. of gold. This battery is now engaged on 60 tons from another claim, and the proprietor tells me the tables promise better than with any of the other lots. He expects to clean up in ten days. Symptoms of a rush have manifested themselves, and there is plenty of room for prospecting, as the same kind of country extends for miles in every direction. The height above water at which all these lots have been obtained is from 60 to 100 feet. A party or two are scattered in remote corners working in the bed of the Shoalhaven River, but they are not accessible for the purposes of this report. No other metal is being won in the district, and the coal leases in Cambewarra have been forfeited, whilst those in Broughton Vale have not been worked, owing probably to the delay in building the bridge across the Shoalhaven River, which is absolutely necessary before any cargoes could be shipped in hulls drawing more than 7 feet of water.

Southern District—Moruya Division.

(*William Clarke, Mining Registrar.*)

In forwarding this my Annual Report upon mining in this district, I regret to state that the prospects during the past year have not been encouraging.

The whole of the mining has been alluvial, and confined chiefly to the Mogo Gold Field, and Currowan, Brouman, Nelligen, and Dwyer's Creek. About thirty miners have been employed in prospecting on these fields, but not continuously. The yield of gold was considerably below the previous year's yield.

In the month of October last Spedding and Burns took up a 6-acre gold lease at Mogo, and intend sluicing and working the same, but have not yet commenced operations.

There has been no work done on the lease known as The Moruya Silver Mine, and the valuable machinery has been idle.

I have the honor to forward herewith returns showing the number of miners employed during the past year, and how they were distributed, the quantity and value of gold won, and the machinery in the district.

Tumut and Adelong District—Tumut Division.

(*Henry Sutton, Mining Registrar.*)

Mining matters are at an extremely low ebb in this division. With the exception of the Great Britain Mining Company at Sandy Creek, the digging is confined to isolated parties of two or three scattered at intervals, and located on the various tributaries of Sandy Creek, Shaking Bog, and Adjenbilly, and Broken Cart Creek.

The Lacmalac Consolidated Quartz Company has long ceased operations, and a valuable machine laying idle. Report, however, says they will shortly resume their labours.

Tumut and Adelong District—Adelong Division.

(*George Morris, Mining Registrar.*)

I have the honor to report to you, that gold mining operations in this district remain about the same as the last two years, and in my opinion will remain so until greater depths are attained. There are now working, three engines for raising quartz in the deepest claims, viz., the Great Victoria; this company obtained the grant of £1,000 during the past year for payable gold over 800 feet deep. The Adelong United have also an engine at work, and work the Prouse and Woodward Claim with same power. The Challenger Gold Mining Company's engine is also working. The general opinion here is, that the claims will yet prove much more productive than they have hitherto; more energy is now displayed, and when greater depths are attained the yield will no doubt be augmented to a considerable extent; this has been proved in the case of Messrs. Annetts and party, the best claim now working on the Victoria Reef, and the fact of the Great Victoria obtaining the £1,000, proving the deeper they go the better the yield. These two claims are adjoining each other. Some of the claims have commenced preparations for using the rock-drill; as to the working of these pieces of mechanism, it would be premature to express an opinion, but it is the opinion that its labour and time saving qualities will soon be successfully demonstrated in Adelong.

I have endeavoured to procure a return of all gold bought in this district amounting in value to (say) £30,000. This value includes quartz and alluvial. At present all alluvial work is stopped for want of water. At Sheperd's Town, the greater portion of alluvial gold is obtained on A. D. Sheperd's claim, which when working employs about sixty men.

The claims working in quartz are as follows. Most of these are working contracts until greater depths are reached:—

The Union.
Research.
Annetts & Co.
Great Victoria.
Williams G. M. Co. (Limited).
North Williams.
Curragong.
Caledonian.
North Caledonian.
Challenger.
Flagstaff.
Adelong United.
Prouse and Woodwards.
Gap Reef.
Great Extended Victoria Claim.

The lode, taking an average of all the quartz claims, will be 13 inches—ground hard—quartz are much intermixed with slate. A splendid yield from 1 ton of stone, a trial crushing, obtained from the Curragong, 17 ozs.

The treating of stone is to crush with battery through Chilian mills. Two machines are (when there is water) worked at Adelong, 15 stampers each.

Tumut and Adelong District—Gundagai Division.

(*A. W. Armour, Mining Registrar.*)

Although this division has been proved beyond doubt to abound in auriferous lodes and veins, I regret to report that only three claims were being worked during the past year, viz., Muttama Reef, De Profundis Reef, and Meurant's Reef.

Muttama Reef is situated in the parish of Mooney Mooney, about 22 miles from Gundagai in a northerly direction. This reef was leased in 1872 by Messrs. Jones & Kennedy, both experienced miners; they formed a company in Melbourne, styling themselves the Enterprise Gold-mining Company (Limited) of Muttama.

This company erected a 10-stamp battery and worked the reef successfully for several years, until they attained the depth of 70 feet, at this level the gold entirely ran out; it was then proposed by the company to sink a prospecting shaft to try and strike a supposed shoot of gold that had been successfully worked on the same line of reef at a distance of about 120 feet south, and which shoot of gold was dipping north to the proposed shaft. Sinking operations were commenced, and at a depth of 100 feet water was struck, here tanks had to be inserted from which the water was bailed by means of a whip and horses. By this means they were enabled to proceed with the sinking of the shaft without interruption. At a depth of 150 feet a small shoot of gold was struck, but sunk through in a few feet as it dipped out at the north end of the shaft. After this no change whatever took place until a depth of 215 feet had been reached, when another flow of water was met with, and so strong that the horses were overpowered and consequently the shaft was swamped. The company being determined to sink to a further depth were compelled to purchase a winding and pumping engine, which has just been erected at a cost of £1,200, and everything is again in working order; but as this last outlay has reduced their working capital, they are obliged to suspend mining operations until they increase it, which they consider will take them about six weeks, when they will resume work. It is to be hoped that this company may be rewarded beyond their expectations for their energy and perseverance.

I may add that gold has been found upon this line of reef for a distance of 4 or 5 miles. It is the same belt of granite country that the Adelong mines are on; and is bounded on the east by greenstone and on the west by slate, very little gold has yet been discovered in the greenstone, but in the slate a number of leaders have been worked with various results. These leaders all run east and west and dip east towards the granite belt.

De Profundis Reef.—This reef is situate on the western range of Jones's Creek in the parish of North Gundagai and about 4 miles from the town. It is now owned by Messrs. Pike and Champion, but was originally taken up by Moroney and party, which party obtained from the first crushing of 5 tons 55 ozs., being an average of 11 ozs. per ton. When this became known a number of claims and leases were taken up both north and south, but none of them ever succeeded in finding the reef, consequently they were abandoned. The second crushing by Moroney and party was 30 tons which averaged 2 ozs. per ton, it was then abandoned and remained idle for twelve months, and was then taken up by the present holders, who have since raised some very good stone as will be seen by the report attached hereto,—depth of shaft 30 feet, stone looking better than it has yet done, channel of reef very irregular, width varying from 1 to 3½ feet. Formation of surrounding country identical with Muttama Reef.

This is a locality that should be reserved immediately from conditional and auction sale, as it has been proved to contain many auriferous lodes that with machinery upon the ground would give good returns, but will not pay to cart a distance of 25 miles.

A. H. Meurant's Reef, situated in the County of Bland, about 40 miles from Gundagai, at a place called Junee. This reef was discovered by Meurant on 13th June last, and is 4 feet wide, also well defined; the shaft is down over 60 feet and has averaged over 3 ozs. per ton; this is all the information I am in possession of respecting this mine. Nothing further has been done in the way of searching for minerals since my last report, owing to the long continued drought.

I am now collecting specimens of the different minerals in this division, which I intend to forward to the Mining Department as early as possible for inspection.

TUMUT AND ADELONG DISTRICT—TUMBARUMBA DIVISION.

(*H. M. Langford, Mining Registrar.*)

SINCE my last report there have been no new discoveries worthy of note in this division. Many of the creeks and old workings have been abandoned through want of water, and mining in genaral has not been prosperous owing to the same cause.

Ournie.—I have nothing new to add to the particulars given of these mines in my last report.

The Nevada Reef, Paddy's River.—There are no returns from this reef, work having been suspended for some time past.

Pilot Reef, New Meragle.—I append report of this reef. For minerals other than gold, the returns are *nil.*

Pilot Reef, New Meragle Creek.

The Pilot Reef Company's leases, Nos. 2 and 3, on the line, comprising 13 acres, have been worked on tribute for the last nine months of 1877, with more or less success, up to the present time.

The tributer has sunk the main or engine shaft to a further depth of 26 feet, making the extreme depth from the brace 130 feet. The country sunk through is very hard, consisting of hard white granite full of heads, and all trenching to the south-west, nearly the same dip and underlay in the lode, with a very large quantity of water.

In my last report we were then stoping from the second or 100-feet level, from which a large quantity of average good stone was removed and crushed, averaging about 18 dwts. per ton. This continued for a distance of 300 feet south of the plat, when all of a sudden the lode disappeared underfoot, and not a vestige of stone could be found east or west; although the walls continued good and well-defined, yet no stone—all appeared to have gone into the country. The tributer then sunk 26 feet deeper, and cross-cut to the south-east with the hope of catching up the lode re-formed below, but a fault had taken place, and 80 feet of solid country had to be driven through before the lode was again cut, and then it was much broken up and dispersed between the walls, and principally composed of granite with small veins interspersed throughout—some of these veins were rich, as in a trial crushing of 100 tons it was found to average 11 dwts. per ton; all the third level, at 130 feet from the brace, for a distance of 300 feet from the plat, south, has been composed of this same material, viz., pure granite.

I therefore consider this a very curious and probably a new feature in this formation worth recording.

Our machinery consists of a 10-horse portable steam-engine, 5-head battery of 6 cwt. stamps, 1 draw-lift 7-inch pump, with complete winding-gear.

No. 1 lease, on the same line of reef, has been worked on tribute by Nagle & Co. They have just completed a small plant of crushing machinery for testing the line.

The alluvial workings in this neighbourhood continue in *statu quo*—no new finds of any consequence, but the small number of men at present engaged appear to be making wages. There is a great want of water, the quantity running in the creeks being barely sufficient to enable the miners to work five hours per diem, the springs at the heads of all the creeks having completely dried up, the supply being nearly *nil*.

The number of men engaged in the alluvial work at New Meragle and Richardson's Creeks is eleven (11). All the other creek workings are abandoned.

TUMUT AND ADELONG DISTRICT—KIANDRA DIVISION.

(*P. Smyth, Mining Registrar.*)

I HAVE have the honor to state that I have nothing new to add to my remarks of last year respecting this gold-field. Kiandra is essentially a sluicing country, and until water is brought on either by the Government or private enterprise must remain unproductive.

Mr. Philip Davis, a gentleman of great mining experience, recently made a rough inspection of the country embracing the head waters of the Tumut River. He estimates the outlay required at from £12,000 to £15,000. In New Zealand the Government have brought on permanent water to all the principal gold-fields, and the revenue derived therefrom in letting out the waters to the miners is something enormous. If permanent water was once obtained, there would be ample employment here for nearly all the miners in New South Wales, the amount of auriferous country being practically inexhaustible. It is reported that one sluicing claim abutting on the main range, worked by four men, took out 200 ozs., working only eighty days, and a great portion of that time only half water, averaging over £2 a day for each man while the water lasted. The yield of gold about same as last year.

TUMUT AND ADELONG DISTRICT—QUEANBEYAN DIVISION.

(*O. Willans, Mining Registrar.*)

IT will be seen from the amount of gold won in this division, I cannot make any favourable report upon the state and progress of the mines in this district. A great cause of the little progress made, being the drought, the only crushing machine in my division being idle for 8 months of the past year for want of water.

TUMUT AND ADELONG DISTRICT—YARRARA DIVISION.

(*John K. Armstrong, Mining Registrar.*)

SINCE May, 1877, mining at Yarrara Reef has been very far from prosperous. Up to that date, and perhaps a little later, some reasonable hopes had been entertained that prospects would improve, and lead to some permanent and profitable workings; but, unfortunately, these hopes were doomed to disappointment, and a steady decline set in, culminating, at the present time, in the almost entire failure of the reefs. It will be seen, from the accompanying return, what the Perseverance claim has done for 1877.

This claim is now at a stand-still, with but small hopes of work being resumed.

During the latter part of 1877 some attempts had been made to start the Just-in-Time and the Rangatira Reefs; but each trial resulted in loss and failure, and it may be said these claims are now practically abandoned. A vein found to have gold, but not yet proved payable, has lately been tried, running into the Just-in-Time Line at right angles, a short distance above the old Perseverance Claim.

But this discovery is thought but of little value amongst the few remaining miners.

No work worth mentioning has been done at Four-mile Creek Diggings during the year, nor does there at present seem a chance of any resumption of work.

There are not now more than ten or a dozen people about Yarrara Reef. The Messrs. Armstrong's store is on the eve of closing, and other removals are it is said contemplated.

There are six or eight alluvial miners at work about the creeks in this neighbourhood, and perhaps twenty Chinese on Copabella and Jingellic Creeks. The amount of gold won by these, scattered as they are, and selling their gold in all directions, it would be difficult to give even an approximate estimate of; but from what knowledge I have of the matter, the yield per man would not in itself be sufficient for his support.

The want of water for gold washing is much felt, and greatly retards sluicing operations.

TUMUT AND ADELONG DISTRICT—ALBURY DIVISION.

(*J. C. W. Crommelin, Mining Registrar.*)

I HAVE the honor to inform you that there was nothing done here last year, there being no machinery and no water. The only claim that was doing anything being one at the One-tree, and they only raised about 60 tons of quartz, which are now lying on the ground waiting for water to enable them to crush. The gold they got was simply a few ounces out of some specimens. There is a crushing machine of four stampers lately erected, valued at about £800; but they have no water to work it. A few fresh claims were taken up at the end of the year; but there is no one working them at present. They say they have good prospects, and the ground will pay as soon as they get water; but as things are now, and have been for months, the diggers have to turn to other work than mining—therefore, I have no return for last year.

There are no alluvial workings going on, that being all done ; but as soon as rain comes, and they get water enough to work the machinery, I am in hopes of seeing a very fair number of men employed. There was not a man at work last week when I was out at the Black Range.

PEEL AND URALLA DISTRICT—ARMIDALE DIVISION.

(*Edward Marriott, Mining Registrar.*)

IN accordance with the usual custom, I have the honor to furnish my "Report of the Mining Industry in the Armidale Division of the Peel and Uralla District for the year 1877."

2. Owing to the want of water occasioned by the severe drought, which has extended over a period of three years, very little progress has been made in mining in this district ; and nearly all the claims at Oban, Puddledock, Cameron's Creek, and Boro Creek, have been almost idle for the past eighteen months.

3. Having placed myself in communication with several of the leading miners in the district, I am enabled to give you the following particulars as to the amount of work done, quantity of gold and tin won, &c., &c., during the year :—

4. *Oban.*—Mr. Thos. Clark states, "It is almost impossible to estimate what each individual miner makes, as there is no co-operation. They all go fossicking about from one place to another. Water has been very scarce this year ; and there has been but little done in the principal claims, as it is all ground-sluicing." He estimates the quantity of gold won to be about 300 ozs., tin about 5 tons. From his own claim at Paddy's Gully he has obtained 90 ozs. of gold (valued at about £337 10s.), and about 2 tons of tin. He also reports—"Veins are sometimes found, but are not saved as they are of no value." There have been about twenty-five or thirty Chinamen working on the Mitchell River during the year, but they are all leaving now. At Oban Creek twelve men are working, and Paddy's Gully twelve men.

5. *Puddledock.*—Nearly all the gold obtained from this locality has been obtained by fossicking, no sluicing having been done for the last sixteen months. As far as can be ascertained from the different claim-holders, the quantity of gold won is about 60 ozs.—averaging about £3 14s. per oz. in Armidale. There are fourteen Europeans and two Chinese living on the gold-field.

6. *Boro Creek.*—Little or no work has been done in this locality, owing to the want of water ; and no estimate of the quantity of gold won can be given. When able to work, the average earnings is from 30s. to 35s. per week per man.

7. *Cameron's Creek Reefs.*—Messrs. Alexander Gallagher and party, the only persons attempting to work in this locality, report they raised about 18 tons of stone during the year, which yielded 27 ozs. 10 dwts. of gold—value, Sydney Mint, £3 17s. 10½d. per ounce. They have also about 40 tons of stone at grass, which they have not as yet been able to crush owing to the want of water.

8. The Bank managers and storekeepers of the town have kindly furnished me with particulars as to the quantity of gold purchased or received by them during the past year (see return herewith)—amounting to 1,240 ozs. 9 dwts. 23 grs.

9. The number of miners' rights issued by me during the year was 80.

RETURN of gold purchased or received at the different Banks and stores in Armidale during the year 1877 (as near as can be ascertained) :—

Gold, where from.	Quantity.			Value—Remarks.
	ozs.	dwts.	grs.	
Oban (principally)	230	9	0	Average value, Armidale, £3 15s. per oz.
Walcha	838	7	0	Forwarded direct to Sydney Mint.
Glen Innes	41	9	6	Do. do. do.
Rocky River ... ... Puddledock and Cameron's Creek	130	4	17	Average value, Armidale, £3 12s. to £3 14s. per oz.
Total	1,240	9	23	

PEEL AND URALLA DISTRICT—NUNDLE DIVISION.

(*Samuel Kermode, Mining Registrar.*)

Nundle Quartz Reefs.

THERE are only two veins being worked in this locality.

1. The Brown Snake Reef, which crosses the new cut road from Nundle to the Hanging Rock. This vein was first found by Messrs. Joseph Clarke and William Henry, and worked by them for a few weeks ; they obtained about £300 worth of gold in sinking a shaft about 30 feet deep ; at that depth the reef seemed to pinch out, and they then abandoned the claim. In August last Messrs. Bakewell and Patey took up the same ground, and have been doing well ever since ; they have obtained over £1,000 worth of gold up to the present date, the number of men being at work was two for the first four months. They have put down a fresh shaft about 50 feet, and out of this shaft they have raised about 20 tons of quartz. The gold is in patches or pockets in this reef. As much as 90 ozs. of gold has been taken out in one bucket of the reef. This vein runs north and south and dips to the east.

2. John Powell and party's lease on a quartz reef in Spring Creek, near Nundle, is being worked, but they have only lately started; they have nothing to report as yet, although as far as I can judge, I believe it will turn out well if the owners will have patience to sink to a lower level.

Bowling Alley Point Reefs.

3. Foley's Reef has been worked for a few weeks on trial, but did not give satisfaction.

4. The old reef known as the Golden Hole Reef, at Bowling Alley Point, has been lately taken up by Messrs. Stewart and party; they are hard at work night and day bailing the water out of the old workings. If they can beat the water I have no doubt they will strike some more rich patches, such as were taken out of the same reef a few years ago.

Quartz Reefs at Bowling Alley Point, on the Peel River Company's Estate.

5. The well-known Marquis of Lorne Reef is still being worked night and day; the owners of this mine decline to give any information as to the work done, or quantity of stone raised, or gold obtained from the reef. But, if rumours are true, they are still raising rich stone to the surface.

6. Mr. Wyman Brown's party is at work on a reef on the above estate, and have crushed a few tons of stone which yielded 2 ozs. and 3 dwts. per ton.

Foley's Folly Reef, Hanging Rock.

7. The well-known Wheal Prosper Mines are being worked under the management of Mr. John Stanning. The deepest shaft is standing at the same depth as in my last report, viz., 435 feet. The manager has been putting in levels along the veins; he has a considerable quantity of stone to the surface, but on account of the dry season he has not been able to crush, therefore he cannot give any account of what the stone may yield.

In consequence of the bottom of the deep levels in this mine being filled with water, and the manager not having water on top to drive his water winding machine to lift the water from the bottom—being 435 feet—he was compelled to raise quartz from high levels in the mine, which is not considered to be as rich as the stone in the bottom part of the mine.

8. Mr. George Bond's quartz reef at Quacka Nacka, near the Foley's Folly Mines, has been prospected for a few weeks, but he has not had a crushing. The deepest shaft on this reef is 60 feet, and the deepest level about 50 feet. Mr. Bond has about 10 tons of quartz on the surface, but has not any water to drive his water-power crusher. so he is unable to give any account of the quantity of gold the stone may contain.

9. The Moonlight Reef has been idle all the year.

Nundle and Hanging Rock Alluvial Claims.

10. I have not much to report concerning the Mount Misery Cement Lead. There have only been three parties working there, and only one of the parties has made wages during the whole of this year, and now they are all at a stand on account of there not being sufficient water to wash the dirt.

11. There are two parties, viz., Messrs. Thompson and party, and Mr. Robson's party, driving into the mountain at the head of Dangar's Gully, near the Hanging Rock, searching for a continuation of the Mount Misery Cement Lead; although they have driven into the mountain for several hundred feet, they have not yet reached the main lead.

12. Mr. W. Stephen's alluvial claim on the Hanging Rock is being worked on tribute, but has not turned out well, on account of the water being so scarce—not enough to wash in boxes. I may say that there are not any other alluvial claims at work about Nundle or the Hanging Rock, the greater portion of the miners are fossicking about the creeks and hills, with the expectation of finding another Brown Snake Reef, as mentioned in the first part of this report.

Alluvial Claims at Bowling Alley Point.

13. There are but a few miners employed at this part of the diggings, the greater number being Chinese fossicking along the river-bed, there not being water out of the bed of the river sufficient to try a prospect, and even the river is nearly dry—it has stopped running in many places.

Antimony Lode at Nundle.

14. There have been two men at work on this lode for several months, their deepest shaft is about 60 feet, the lode does not seem to make any thicker, it varies in width from ½ an inch to 5 inches, and in many places not pure, it seems to be mixed up in a hard brown rock. The proprietors have sent several tons of ore to Sydney. I did not ascertain the value received for it.

Machinery on the Nundle, Hanging Rock, and Peel River Gold Fields.

15. The only machine which has done any crushing on these diggings is the 15 horse-power steam engine and battery at Bowling Alley Point, the property of a Tamworth company, but now leased to Mr. William Stewart's party. This machine has recently crushed a quantity of stone from the Marquis of Lorne Reef, which I believe turned out some large cakes of gold.

16. The old water-wheel crusher at Bowling Alley Point, the property of Mr. J. P. Robertson; the water-wheel crusher at Foley's Folly, the property of the Wheal Prosper Gold Mining Company; the water-wheel crusher, the property of Mr. George Bond; and the water-wheel crusher at the Moonlight Reef, the property of the Moonlight Company,—have all been idle the whole year, through not having any water to drive them.

The 15 horse-power steam engine and battery at Bowling Alley Point, formerly the property of the Opossum Gold Mining Company of Newcastle, has been removed from these diggings, and I believe it is now erected on the new diggings on the Barrington River, near Gloucester.

The 15 horse-power steam engine and battery at Mount Misery has been removed from that place, and I believe is now on the tin mines in New England.

17. The estimated value of the machinery in this division of the Peel and Uralla Mining District is from £4,000 to £4,500.

18. As far as I can ascertain, the quantity of gold obtained from alluvial claims in this division during the year 1877 is about 900 ozs.; value at £3 13s. per oz., £3,285.

19. Including the gold obtained from the reefs on the Peel River Company's Estate, there must have been over 2,000 ozs. of gold obtained from all the quartz reefs in the division during the year 1877, value at £3 12s. per oz., £7,200—making a total for the year of alluvial and quartz gold—2,900 ozs., value £10,485.

20. The estimated number of men employed in mining in this division during 1877 is about eighty Europeans and seventy Chinese, holders of miners' rights, and there are about twelve or fourteen miners who work on the Peel River Company's Estate without holding Government miners' rights.

PEEL AND URALLA DISTRICT—BARRABA DIVISION.

(*John Flanagan, Mining Registrar.*)

FOR the past year there is little change in gold mining in this division. Owing to the long drought and want of water, all kind of work is at a stand; several of the alluvial miners have large quantity of stacked dirt awaiting a fall of rain. A Mr. Fletcher, an old and experienced miner in this part, lately opened a new quartz reef at Crow Mountain, from which he obtained gold to the value of £500, and four other ordinary claims have since been taken up in the same locality. Fletcher and Co.'s claim looks very promising. There are at present about twenty men employed quartz reefing at Crow Mountain.

PEEL AND URALLA DISTRICT—BINGERA DIVISION.

(*Michael Doyle, Mining Registrar.*)

I HAVE no improvement to report. The long continued drought has affected mining to a considerable extent, on account of there being no water. No new fields have been found in this division during the past year, and there is but very little doing at the present time; but I anticipate that if water becomes available, there will be a good many miners in this locality during the coming winter. There are a large number of men to be observed now knocking about seeking employment, who would embark in mining if there was any water to operate with.

PEEL AND URALLA DISTRICT—SCONE DIVISION.

(*J. F. Wilshire, Mining Registrar.*)

IN furnishing my Annual Report for this division of the Peel and Uralla Mining District, I have the honor to state that there are but few individual miners employed in searching for gold, and from these I have not been able to obtain a correct estimate of the quantity of gold won, as they dispose of the parcels to the different storekeepers and Banks.

Many of the miners are working old and abandoned claims and obtaining gold.

There is no alluvial mining carried on at the Upper Hunter Gold Fields at present.

The Fuller's Reef Gold Mining Company have crushed on their own account 124 tons, yielding 125 ozs. of gold, and 48 tons for other persons yielding 43 ozs.; their tunnel has been driven 1,105 feet along the course of the lode north, averaging 10 inches. The deepest shaft is 220 feet. The company expect by the beginning of this year to have employed from fifteen to twenty men.

I have on a former occasion furnished you with the number of machines in the district, and these have not been increased, and owing to the dry season have been kept idle for some time past.

Within the past month a claim has been taken up at Omadale Reef, good prospects having been obtained, but I have not received any official information on the subject.

The number of miners' rights issued during the year is thirty-seven, and one business license.

PEEL AND URALLA DISTRICT—TINGHA DIVISION.

(*Thomas Jones, Mining Registrar.*)

IN opening my report for the past year, of the various claims working in this division, I regret at the present period that a protracted drought is causing general inertness throughout the field; and from the fluctuating state of the tin market, and absence of capitalists in the field, there is no special inducement for enterprise; however, I shall endeavour to show the position of the district in general, and the mining interests on which its future prosperity so much depends.

In estimating the amount of ore won during the year I have gathered the information from various sources, and can quote 1,800 tons as the maximum total of ore raise in a marketable condition; and although these figures show a decline in the yield, I believe the deficiency to be entirely dependent upon unfavourable localities, where suspension of operations was essential, from the accumulation of wash-dirt and utter inability to wash up.

Owing to the lengthened drought the main workings on Cope's Creek have been exceptionally facilitated by entire absence from floods, and in many cases the back blocks have received a sufficiency of storm water, from time to time, to enable washing operations to be carried on successfully; still the retarding of prospecting parties has undoubtedly had a vital effect on the general prosperity of the field, and in no way can the deficiency be attributed to other causes.

The tribute system (as I shall endeavour to show *throughout my report)* on this widely spread but "poor man's" diggings, appears to entirely crush the industry (for a European); were lessees to employ wages men the evil might be remedied, but on the contrary tribute is *frequently* demanded by lessees 24 hours after the land is taken possession of, and even prior to the application being lodged; it is an entire system of chicanery, midnight pegging out blocks, and so forth—hence my strenuous endeavous to uproot such evil; however, I believe unless some other depression takes place in opposition to the tin mining industry, a further influx of Chinese may be anticipated, which will result in an increased return of ore won for the current year, and any decrease that may be prophesied will be premature; but I cannot but suggest, that whilst *penurious* leaseholders are permitted to obstruct the development of *alluvial* resources, *no social* benefit will accrue to the district.

Messrs. Martin and Irwin's mine has, with the primitive appliances of greenhide buckets and wooden windlass, yielded handsome returns, and may be classed as one of the most payable claims yet discovered; its workings vary in depth from 2 to 40 feet, and depth of deposit from 5 feet to 2 inches, and has been worked continuously by wages-men and tributors during the past year. The proprietors, who are *bonâ fide* mining residents, have built comfortable homesteads, and are well deserving of the highest eulogium in relation to the exemplary observance of the working conditions of their leases, and general development of their mining property; much more ground remains to be worked, and it is anticipated the yield will equal in richness any previous workings; the payable richness of this lead has been fully proved, and it is to be regretted so much valuable land in its surroundings is locked up and lying comparatively idle.

The Inverell Company's ground in this vicinity remains unworked, likewise nearly all the property in this vicinity.

Messrs. Woods and Brickwood have made but little progress recently in prospecting their blocks. The ground after leaving Messrs. Irwin's claim considerably deepens, and the tributors will not undertake to prospect ground at their own risk for the ultimate benefit of lessees who offer little or no encouragement. A comfortable homestead is erected upon this claim, and one extra hand is employed in prospecting with the addition of one horse that works a whip. At the early part of last year tributors were buoyed up with the hope that rich lasting deposits would be found, but as those expectations have not been realized, extra inducements are required to prospect such deep ground.

The non-observance of clause 2, contained in mineral leases, "for working all lawful days *without interruption*," appears totally ignored throughout the division.

The Union Company has also ground in this vicinity, but all workings are suspended on the various blocks extending as far as the Ponds Creek, and there the absence of water is much felt. Chinese tributors have recently suspended operations on the Ponds blocks, who were working at a tribute that would not admit of stacking dirt for any lengthened time.

In this particular vicinity some hundreds of acres have been forfeited recently by the Department of Mines, but impediments by free selection have acted as a check against mineral development, and now particularly calls for the immediate interference of the authorities to prevent selectors from monopolising extensive tracts, to the detriment of the mining community.

Middle Creek.—This once favoured locality is now all but abandoned, and mining operations have been long suspended. Companies have been wound up, and I am unable to report any progress of moment, and with the exception of fossicking any mining there is unworthy of note.

The Macintyre River.—My division being so extensive, I failed in my last annual report to make mention of this important locality, and indeed but for the public announcement of a sum of £400 having been paid for a mining plant, I was unaware of its existence; however, the property known as the Karaula, consisting of 10 horse-power engine, centrifugal pump, and other mining requisites and appendages, has become the property of the Union Company. Great difficulty in treating the large deposits of conglomerate has hitherto been experienced in successfully disintegrating the stanniferous granules from the conglutinated quartz, waterworn pebbles, sandy ferruginous clay, and granite, which altogether form a mass of cement caused by the action of lime and oxide of iron; but as its present proprietors have recently supplemented the machinery with a very valuable 5-stamp battery for crushing, and aided further by Russell's patent dressing appliances, I can but anticipate, from the great extent of conglomerate already raised, that its proprietors may receive a valuable reward under such favourable auspices, and astonish our Cornish brethren with the boundless resources of this "New Britannia" in the antipodes.

This El Dorado of stanniferous wealth, characteristically designated "New England," merits special legislation for its exhaustless mineral resources, which have already during the last four years shown a total return of some 7,000 (seven thousand) tons of 73 per cent. ore. As a poor man's diggings, *in a favourable season*, it stands pre-eminently in advance of the more alluring "gold-fields," inasmuch as no man of an enduring constitution, or practically a "miner," need anticipate the reverses so frequently met with on even a payable gold-field, the alluvial deposits being so widely scattered, gives to the industrious Chinese a special attraction throughout the field; however, the baneful practice of lessees holding an inordinate number of acres is apparent, and the decreased European mining population affords striking proof of their intention of disclaiming connection with an industry so void of legislation that will enforce the working conditions of mineral leases. Without further digressing I will proceed to give a detailed account of the workings on

Cope's Creek.

1. Near the township of Kimberley, which is still all but deserted, a party of six Europeans are working.
2. Hawkins's steam saw-mill is still actively engaged.
3. Several parties of Chinese are working in this vicinity, and as they have located themselves here for a long time, I presume the ground is fairly remunerative, the stripping is deep, and the wash apparently very

poor. They reply, "littee bit," and "no sabbee," one cannot therefore derive a great amount of information from them; and as the Mining Act is so inoperative, one license being produced as Ah Chow, it is represented as standing for the whole party—they all answer, "Ah Chow, no sabbee," and are difficult to identify.

4. Captain Swinton's property still gives employment for Europeans and Chinese on tribute, whose return is estimated at 200 tons for the year.

5. The Victoria Company was a few months back purchased by the Union Company, and still continues to make fair returns under tribute. This property sold at public auction for £100.

6. The Inverell Company, conspicuous for long suspension of work.

7. The Scotia (Union Company's) affords steady labour on tribute to a party of Chinese who have superseded Europeans, the ground being too deep and poor to offer sufficient inducement on tribute for the latter. A 10-horse-power engine is employed.

8. *Wrighton.*—With the exception of one European party, patches leading into the banks of Cope's Creek are worked by Chinese, and in my opinion will, from the success of others, continue to be worked for a considerable time. The heavy deposits in the bed of the creek have been worked out, and nothing remains but deep stripping on the banks; and judging from the influx of Chinese, and their readiness to accept ground on tribute, I fully anticipate seeing a large number (if exempt from floods) working the untried banks during the current year.

9. The Union Company's blocks, formerly in possession of the Tingha Company, who disposed of their interest for a mere cypher, has had a party of tributors working for a lengthened period, and are now working the richest face ever yet discovered on the tin-field; the stripping being exceedingly deep (30 feet), but of a very light description, leaves a very rich wash averaging from 1 to 6 feet, which yields a handsome return to the lessee, *at a tribute of* £28 *per ton* when the *local value is quoted at* £38 10s.; however, the market fluctuates, and £32 10s. is now the ruling value of fair marketable ore. The exceeding richness of this claim proves the utter futility of prognostications as to worked out ground. At the present time most contradictory opinions are expressed by *practical* mining managers as to the probable continuation of the deposit or its immediate cutting out by high bars in sight, which its late proprietor (who possessed a boring machine and imagined the ground practically tested) contends must crop up within a few feet of the present workings. With all due respect to opinions offered, I have also one of my own, and deem it quite compatible that these alluvial deposits of the Miocene period, overlaid with about 30 feet of water-worn gravel and sandy ferruginous clay embedded with water-worn pebbles and coarse sand will be of no great magnitude, but yet prove a most valuable property to the company who, fortunately, possess a mile or more of frontage *on either bank.* Leaving this locality a long stretch of probably *payable* ground intervenes, most of which is reputed Union Co.'s ground.

Tingha, which is situated on the left bank of Cope's Creek, is practically a mining township. Having failed in my last annual report to give this head-centre of our tin-field the prominent position it deserves, I now briefly record that it consists of four hotels, five stores (three of which are Chinese), a public school, Warden's Office and Court, Post Office, Court of Petty Sessions, Police Barracks, and Court House, the latter being in course of erection on a Government reserve. The entire township is noted by its absence of the erection of public buildings or Banks. Above Tingha, at the confluence of Darby's Branch with Cope's Creek, is situated the principal head-quarters of the Britannia Company's mineral property, which surfacing blocks have long suspended mining operations in consequence of protracted drought; and under the same category I include the Black Angel and Bismark properties, which have both suspended operations. To the westward, on Stony Creek, is the Union Company's tunnel claim, which at the early part of last year the company extensively tested by tramway and trucks, which soon proved the mineral resources to be of no permanent character, resulting in suspension of operations, and the property has since remained idle. About this property, on Stony Creek, is Henry Budden's registered claim, which is worthy of being noted as a good payable claim, and its proprietor, who has now for upwards of three years perseveringly worked the claim without interruption (except by authorized registration of suspension) is now reaping a just reward for his perseverance. There is much ground in this vicinity open for restriction, and as the country consists of basaltic trap, overlying the bed of an ancient water-course, there is every probability that the continuous hills extending several miles in a north-easterly direction may be found payably stanniferous. This lead is considered by many to be a continuation of the rich basaltic formations known as the Chinaman's Lead. Owing to the successful and uninterrupted working of these rich deposits during the past year, and the prominency attained by the litigation in the suit, Hall *v.* Moore, in the Warden's and District Court, great endeavours are being made to hold ground in this vicinity; therefore, any attempt to acquire title to such ground, without conforming to the working conditions of the Act, is likely to prove futile. Shafts have been sunk through basalt 70 feet deep, sufficiently rich to induce the Mongolian miner to give 3 cwt. out of the ton and work the ground on tribute, which may under ordinary circumstances (as in adjoining claims) upon a general washing-up afford a return of something less than 30s. per week per man. This may suit a Celestial digger, but the European miner feels it an injustice, and except in *rare instances* (where he can exert his "mineral licence" on Crown Lands) he vacates a field, *where wages are not obtainable, so long as the working conditions are not enforced.*

Hall Bros. Claim.—The restitution of this property, which awakened so much interest in mining circles, and after much litigation in proving a perfect title passed ultimately into the possession of W. R. Hall (to whom it was originally surveyed and the lease issued), has during the present drought suspended operations. In speaking of this property, it is commonly known the Government Geologist (Mr. Wilkinson) some years back pointed out from geological observation of the surrounding strata in this particular locality, that there was ample justification for predicting that beneath the basaltic lava now filling up this ancient river-bed stanniferous deposits probably existed. It is therefore most pleasing to find, by the perseverance of the Australian digger, that the light and truth of science applied to mineralogical discoveries have been so practically tested; and further, that our Geologist should have associated himself with such predictions, speaks volumes; even to the most sceptical, and it may be finally cited as a practical illustration of the intrinsic utility of geological surveys, in connection with the development of this comparatively inexhaustible field of mineral wealth.

Hall Bros. No. 2.—This property was also the subject of much vexed litigation, Hall *v.* Ah Bing and party. However, the claim, like the preceding one, was ultimately (by arrangement) restored to Mr. Hall (to whom it was originally surveyed and leases issued). It is now continuously worked by a large party of Chinese tributors at 3 cwt. per ton, and continues to exceed the most sanguine expectations in its lasting qualities. The protracted drought considerably adds to the working expenses in washing up. The sinking varies from 12 to 20 feet; depth of wash, 9 inches to 18, and width varies.

Ah Cue's Claim, the property of Mr. S. Moore, is worked by a party of thirteen tributors, upon the usual tribute terms, 4 cwt. out of the ton—one fifth; the yield of ore which has been raised during the past year may be estimated at 40 tons, which may be now locally valued at £1,280; deducting one-fifth leaves a balance of £1,024, which gives to each man £78 15s. 6d. per man, or a trifle in excess of 30s. per week, whilst the lessee shares the balance, viz., £256, for the simple investment of £5 per year for rent. The tributors are supposed to find every imaginary needful appliance, from greenhide buckets to candles, the latter being a heavy item (say) £25. I am not disposed to go into more minute particulars, but would draw your attention to the result. The tributors after washing up (which in this instance has happened but twice during the year) find the claim "won't pay" on such usurious tribute terms; they become dissatisfied, and the wide-spreading report is "the field is a duffer"; the final result in many instances is, that the ground is left and work suspended, the lessee imagines he is not compelled to work it (more particularly when wages men ask 45s. per week), and a violation of the Act and Regulations ensues until some inexperienced dupes venture another trial. I hope this elucidation will prove the evil of such tribute system and the fatal consequences it has in *obstructing* the development of the field. I have read many of the Mining Registrar's reports, and fully endorse the remarks relating to apathy and difficulty in procuring information, but may here say my information in this instance was obtained from the tributors themselves and endorsed by corroborative and disinterested testimony.

Sutherland's Water.—Several claims on this creek are now worked by Chinese, and for steady results will bear favourable comparison with any like area in the division. With the exception of a few holders of mineral licenses, all the claims are worked by Chinese tributors—no wages men being employed. My remarks relative to other portions of the field are equally applicable here, and beyond remarking that the claims in this vicinity will be worked for a considerable time, I deem it is all that is required.

Long Gully Mine—The property of the Union Company, has long suspended operations; the ground was opened by wages men, but tributors cannot see sufficient inducement to work it—hence it lies idle; lodes are all idle.

Mineral Leases.—The number of acres applied for during the past year amounts to 1,180, 400 of which have been applied for by one company. I would here briefly advert to the objectionable practice of taking possession of forfeited ground at the hour of midnight—12–1 o'clock a.m. (being the earliest hour forfeited ground is open to re-selection). Special legislation on this point would be hailed with great satisfaction by many a horny-handed miner, if frustrating the advantages of telegraphic communication which the *bonâ fide* miner cannot be always alert enough to command.

Mineral Licenses.—Owing to the ineffectual measures taken to enforce the holding of mineral licenses, the compulsory holding clause is looked upon by many with contempt and as abortive; within the precincts of this division it has been denunciated as tyrannical and oppressive, and has resulted therefore in the total being 129 only.

The applicant for a "gold mining lease," must be the holder of a "miner's right" (as qualification I presume), yet I fail to observe provision made that the applicant for a "mineral lease" must hold a "mineral license"; in the latter case he takes possession and posts notices, and frequently with no intention of taking either lease or license, but in virtue of "application pending" works the ground, thus defrauding the revenue under renewed notices.

General Remarks.—My opinion is, after mature deliberation, that the present system of permitting lessees to hold an inordinate number of acres without making any provision for working the same, except by tributers, is crushing the tin mining industry, and has driven the *bonâ fide* miner off the field. In compiling my last annual report it was certainly thought by me, from the voluntary stipulations embodied in the application, that as many as 8, 10, or 12 men were to be employed under each lease, or for non-fulfilment forfeiture would ensue. However, these conditions have been everywhere shirked, and the European miner being unable to obtain legitimate labour has left the field. The late Proclamation is putting lessees to their wits' end; and should all the leases issued, where the working conditions can be enforced, be cancelled for non-observance of the Act and Regulations, it will create a healthy impetus, and causing re-action, probably prove the salvation of the field. The fact speaks for itself: the tin ore is here, miners cannot make a living by giving tribute, the lessees won't pay wages, consequently the land is held on spec, and present commercial stagnation involved.

I might estimate the machinery, including 8 portable engines, 2 crushing plants, working gear, Californian pumps, sluice boxes, &c., &c., and such primitive appliances, in round numbers, at the value of some £7,000; but I deem it idle to make any such computation, further than to show generally the very primitive state of the workings of this field.

Having been very promptly supplied (upon application to the Department) with a tracing of mining properties in the vicinity of the parish of Anderson, county Gough, I may mention the properties of the Elsmore, Newstead, and other mines, in this vicinity, have received no special observation from me, owing to long suspension of mining operations (of any magnitude); but as the owners of such properties have disposed of their machinery and mining plant, or otherwise stored the same for preservation, it is natural to suppose no great expectations can be anticipated without a very unexpected change takes place.

Machinery long lying idle depreciates much in value, and where it is a drug in the local market I leave computation for those more experienced than myself in such matters; notwithstanding I have endeavoured to effect sales by public auction, and found result of local competition most unsatisfactory.

The present population may be estimated at some 900 adults, 700 of whom are Celestials. This shows an increase of some 400 since my last annual report. I will not cast doubt on our Chinese merchants' approximation of the total number of their countrymen here; but can endorse it as approaching accuracy, and am informed an influx may be expected.

PEEL AND URALLA DISTRICT—BACK CREEK DIVISION.

(*P. J. Langworthy, Mining Registrar.*)

THESE diggings are now at rather a low ebb as to yield of gold, on account of many of the reefers being employed in making roads on which to convey their quartz to the machines.

Two quartz crushing plants are now on the field. That belonging to Messrs. Watt & Driscoll was in operation during the last quarter of last year. The other, which is the property of Messrs. Burley and Thomas, being only now in the course of erection.

The 50 men employed on Back Creek Diggings about the close of 1876, have now increased to some 250, and the 5 or 6 reefs then discovered now number from 16 to 20. Sixteen of these reefs are being worked, and bid fair to be payable. Some shafts on these separate reefs are sunk to a depth of 40 feet, with good prospects, and some of the lines of reefs are pegged out to the extent of 3 miles. They are all within 3 miles of each other, some running from one spur to the other, whilst others are bearing with the main range. The formation of this field is a high dividing range, running towards the Hanging Rock Diggings, with steep spurs running down into the creeks and rivers.

77 leases have been applied for, and when granted and worked, doubtless the returns from this gold field will be better than heretofore, and if not grand something considerable.

PEEL AND URALLA DISTRICT—WALCHA DIVISION.

(*Milton S. Love, Mining Registrar.*)

I HAVE the honor to forward herewith Annual Report for year ending 31st December, 1877, upon the Gold Fields within the Walcha Division of the Peel and Uralla District.

Glen Morrison Gold Fields, Golden Star Claim, Messrs. Kitcher & Co.

1. From information received on a visit to this field during the last week, I have to report that a crushing of fifty (50) tons of stone, obtained at a depth of from 75 feet to 100 feet, took place in April, 1877, yielding 716 ozs. Since that date the depth of main shaft has been increased to 140 feet, and 20 tons of stone are now at grass awaiting the next crushing, which it is expected will be about April, 1878. There are five men working at this claim. The machinery used being a derrick or horse-whip; and the stone at present being raised is of good gold-bearing quartz. The vein from 5 to 6 inches in width, dipping west 1 in 5. Judging from specimens exhibited, I might safely say the prospects of this Golden Star Claim are promising to a degree.

Twenty-five Acre Lease, including the Golden Bar Claim, Messrs. Keogh & Ogilvie.

2. This lease was applied for in August, 1877, by Messrs. Keogh and Ogilvie, of Victoria. Practical miners were obtained from Sandhurst (Vict.), and operations commenced at latter end of year. A shaft has been sunk to a depth of 60 feet without striking vein; and as these operations are in the hands of men of experience, the result of their labours is eagerly looked forward to, and will to a very great extent prove the growth or otherwise of this gold-field.

Son of Temperance Claim, Moloney & others.

3. I was unable to obtain any reliable information respecting this claim; but I believe there are three men at work, and there are several tons of stone at grass. A 15-stamper *crushing machine* has been erected about 2 miles from the claims, at a cost of about £3,000, by a company, the members of which are far from being satisfied with the speculation.

Tia Reef, Denne's River.

4. This reef, on Mr. David Denne's station, distant from Walcha about 22 miles, is being worked by Messrs. Mathieson & Co. A depth of 24 feet has been reached; the vein 4 inches in width, apparently fair. 40 tons of stone are at grass, and as there is no way of crushing in the immediate neighbourhood, it is the intention of the proprietors to convey the stone to the machine at Glen Morrison, a distance of 20 miles, for the April working.

In conclusion, I may add, that at the commencement of the Glen Morrison Gold Field, some six or seven years back, several claims were taken up; but from want of experience, rather than from want of capital, they were abandoned, with two exceptions; and it is apparent that had those persons who abandoned their claims exercised patience and perseverance, combined with a little scientific knowledge, the Glen Morrison of to-day would have been in every respect a success.

PEEL AND URALLA DISTRICT—GLEN INNES DIVISION.

(*W. C. Rodgerson, Mining Registrar.*)

As shown by the accompaning return, the principal tin workings in my division are those situated at Skeleton Creek and the head of the Severn, at which places about 50 miners are at present located. The population is a fluctuating one, the average number being 35.

During the past year I have issued 40 mineral licenses, 1 business license, and 47 miners' rights.

About 100 tons of tin ore have been raised during the same period, the value of which may be estimated at £3,000 on the ground. The depth of the deposit of tin is from 4 to 14 feet, and from 8 inches to 4 feet in height, and 20 to 200 feet wide.

Gems have been found in quantities—topaz, sapphires, garnets, and amethysts, the former being of large size and perfect clearness. The sapphires are of good size and deep in colour, but so clouded as to be not worth cutting, and hence they are of small commercial value. Not having heard of any sales being effected, I am unable to estimate the value of the gems I have enumerated.

Gold mining operations have been limited in extent. At Glen Elgin the water supply has been totally inadequate for slucing purposes. At Oban the yield is now so poor that the workings there are nearly abandoned. At the Starlight Reef, Oakwood, nothing has been done beyond placing machinery on the ground.

New England and Clarence District—Vegetable Creek Division.

(*Geo. H. Gower, Mining Registrar.*)

I do myself the honor to forward my Annual Report for 1877, on the Vegetable Creek Tin Mining District, for the information of the Honorable the Minister for Mines :—

The yield of tin ore from the various mining properties in Vegetable Creek district has been very limited this year, not only on account of the original holdings being nearly worked out, but principally from the almost total suspension of all mining operations, through the long and protracted drought the whole of the mining district has suffered.

The yield of tin ore from all the mines for 1877 is 1,745 tons, which compared with the previous year shows a decrease in the yield of 1,259 tons of ore, owing almost entirely to the want of water for slucing, as there are now lying idle, only on that account, three or four large mines, with many smaller ones, on deep leads of stream tin, all opened out by numerous shafts and great extent of driving, exposing without doubt very valuable and extensive leads of tin, which, when sufficient rain falls to fill all the dams and reservoirs erected and excavated since the early part of the year, will ensure constant work for numbers of miners for many years, and the output of tin ore will be very much increased.

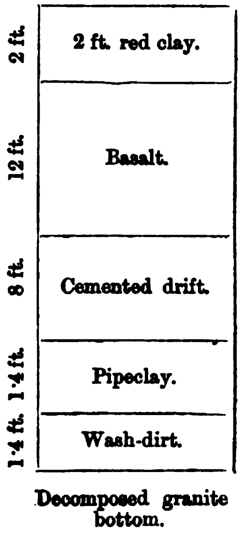
The most recent of the deep tin mining discoveries is the Y Water and Graveyard Deep Lead, bidding fair to eclipse deep leads hitherto worked, if not in actual richness of the wash, certainly in the quantity and extent of the deposit.

This lead is apparently the bed of the extinct creek, which when temporarily obliterated by the flow of basalt during the volcanic period now exists in a new channel, or the present Graveyard Creek which it will be observed by referring to the plan herewith preserves an approximately parallel course with that of the old water-course.

This deep lead follows nearly the convolutions of a belt of basaltic soil, which is narrow near the assumed source of the old water-course (the Tent Hill Range) and opens out into a succession of higher basaltic hills as it proceeds westward. This is readily accounted for, by the flow of water having been proved by careful levelling to have been from east to west, and the accumulation of basalt having consequently been greater where the channel became wider and less confined by the granite ridges that formed its barriers.

As before stated, the extinct water-course apparently headed from the Tent Hill Range, and in proof of this theory the continuation of the same lead has been found by Messrs. Richard Donoghue and party at a spot about 40 chains north-east of Messrs. Moore & Co.'s, and Cadell, Mitchell & Co.'s, lands, on the side of the Tent Hill Range.

There the deposit discovered at a depth of 22 to 25 feet from surface, although not heavy is good and the wash-dirt, character of tin-ore, and nature of the strata, through which the shafts were sunk, are precisely similar to those found throughout most of the other portions of this lead, particularly those near the Y Water-holes Creek.



Messrs. R. Donoghue and party have 20 acres under mineral lease, and are prospecting their ground thoroughly before opening out.

Next in succession comes Messrs. J. Moore & Co.'s land, through which the lead runs, but in which it has been intersected by the western branch of the present Y. Water-holes Creek.

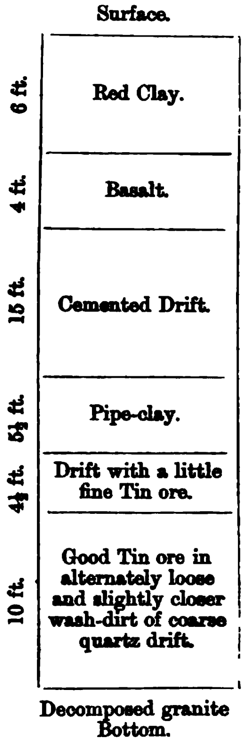
This has cut away a large area of the old deposit, but is beneficial in providing a plentiful supply of water, which, with the aid of machinery to lift it to the faces of wash-dirt, would render the working of this ground a very remunerative occupation for many years, but the wash-dirt is not sufficiently rich to be profitably carted to the dams now used, at the present low price of the metal.

This ground is now being worked by a party of Europeans on tribute. The total area held in this neighbourhood by Messrs. J. Moore and Co. is 800 acres, but the deep lead appears to be confined to the belt of basaltic country which runs through the portion shown in the plan in a north-easterly direction and thence northerly to the portion before mentioned, or that now being prospected by Messrs. Donoghue and party.

The next claim on this deep lead is held by Messrs. Alfred Cadell and party as a mining conditional purchase (area 540 acres).

The owners have not yet worked the land, but have devoted the past twelve months almost exclusively to prospecting it thoroughly, and in preparing and fixing their machinery and erecting all necessary improvements, buildings, &c., which they expect to complete by the end of January, 1878.

These preliminary arrangements have been made, and the ground has been most satisfactorily proved at a cost already exceeding £1,500. Forty-seven (47) shafts have been sunk, and a great extent of driving has been done in the ground. The average depth of the shafts varies from thirty (30) to forty-five (45) feet, and disclose a vast deposit of wash-dirt more or less rich in tin ore, but the most payable portion averages from four (4) to ten (10) feet in depth from top to bottom of wash-dirt.


Surface.
6 ft.
Red Clay.
4 ft.
Basalt.
15 ft.
Cemented Drift.
5½ ft.
Pipe-clay.
4½ ft.
Drift with a little fine Tin ore.
10 ft.
Good Tin ore in alternately loose and slightly closer wash-dirt of coarse quartz drift.
Decomposed granite Bottom.

The lead has been proved to be limited about by the lines which marks its limits in plan herewith, but the most extensive prospecting and other operations have been completed in the eastern portion of the ground, where the extent of deposit containing good tin has been proved to be about six hundred (600) feet in width and about two thousand five hundred (2,500) feet in length. The smallest deposit in any of the numerous shafts there being 4 feet in depth from top to bottom of the wash-dirt; and where the deposit is only of that thickness, the ore appears to be more concentrated and richer in proportion.

Where the wash-dirt is found in larger volumes the ore is plentifully disseminated throughout the whole mass, and as the wash consists almost entirely of clean white quartz drift, the whole can be inexpensively and effectually washed without being puddled, a very important matter where no running water is available.

The chief expense will be the timbering, as the whole of the driving will be through wash-dirt, and there will be no headings. The roof, however, in the drives opened out ready for working stands well, and it seems to be equally good throughout the drives and shafts sunk in all other portions of the ground to prove the extent of the deposit. The abundance of timber growing on this property renders the question of timbering the workings a matter of far less moment than would be the case were props not so readily procurable.

To provide an adequate supply of water for working constantly, two large dams have been excavated and embanked, to which several surface races of great length have been cut to conduct the rainfall to these reservoirs.

A third dam will shortly be constructed (where shown in plan) to serve as an auxiliary to the working dam near the shafts, at which operations will shortly be actively carried on; and in dry weather, should this supplementary supply be required, water will be pumped thence and flumed to the working dam.

At the working dam, situated about 150 yards from the shaft from which this mine will be first worked (and from which 420 feet of working drives have been constructed, the main drive being securely timbered and complete with tramways, &c.) a 7-inch centrifugal pump is fixed, also a portable engine to drive it, and which will raise the water about 15 to 20 feet to a flume conveying it to the sluice-boxes at the mouth of the shaft.

The wash-dirt will be lifted by an 8-horse power double cylinder winding engine (which is now in position at the shaft), and will be discharged into a hopper, from which it will fall into the sluice-boxes, without further handling.

All available means appear to be in use on this mine, for the purpose of obtaining the tin as quickly as possible and with these labour-saving appliances the managing partner (Mr. A. Cadell) considers the ground will be worked very economically, and that the cost of engines, &c., will soon be more than compensated for by the saving in labour (both horse and manual) and also by concentrating operations.

Engine-houses, tin store, and other buildings are nearly completed, and all will very shortly be in working order.

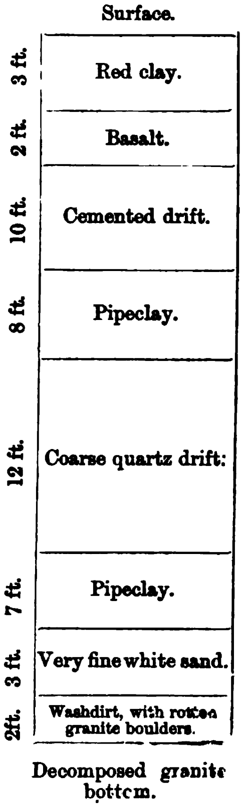
It is difficult to form an estimate of the value of this property, as from 4 to 5 years' steady work, at 100 cubic yards of wash-dirt per day can be seen proved, and yet only a portion of the ground has been fully prospected.

It is certainly the most extensive, if not the richest portion of any deep lead at present opened up in this district.

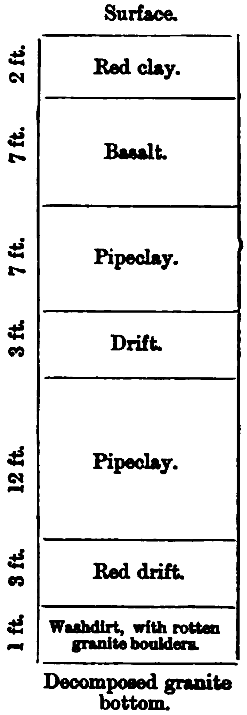
This may be accounted for by the fact that these 540 acres form a basin, surrounded by granite ridges, except where the basalt enters and leaves the land, and that all the country above this area is higher; in short, that this seems to have been the first principal flat into which the waters originally fell, and that here was the first catch, consequently the greatest accumulation of the ore swept from the tin-bearing ridges of Tent Hill, &c., prior to the volcanic and some say as early as the glacial period.

The next spot at which this lead has been prospected is near the eastern boundary of section No. 532, Messrs. William Procter and party, 40 acres mineral lease; but there the channel has been more confined, the water-course more rapid, and the deposit consequently not so rich. The party of working miners who hold the ground, after erecting washing appliances, &c., and obtaining from it 9 tons of ore, found it would not pay well to cart the wash-dirt to the water (about one-third of a mile) at the present price of tin; and some of the partners having better prospects elsewhere, the party became dispersed, and the land now lies idle.

Should better prices be obtainable for the metal in the Home market, it is believed this block could be worked profitably, the lead having been traced and the wash-dirt found as payable on this block's western boundary.

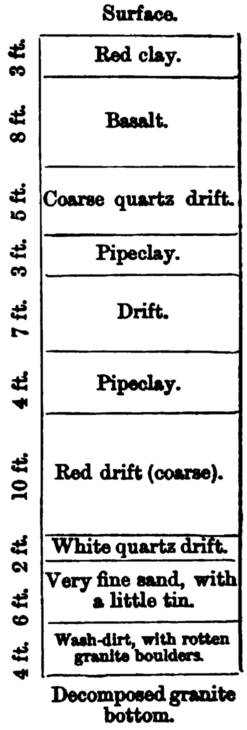


The lead is again picked up, distant about 14 chains westerly from this spot, in section No. 534, Louis Webb and party's 20 acre-mineral lease, and with such good prospects that the proprietors are still opening out the faces of wash-dirt with sanguine hopes of a satisfactory result.

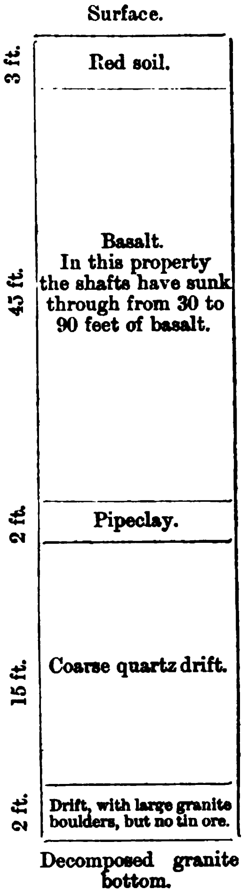


Adjoining this block is the Graveyard portion of the leads held by the Vegetable Creek Tin Mining Company (Limited), who have expended considerable sums in prospecting and opening up the land where shown on the plan.

The area of wash-dirt proved is very considerable; and as washing appliances and a large dam have been constructed near their shafts, a considerable staff of men will be employed when rain falls, but until then all their operations will be totally suspended; but when work is commenced on the large scale projected, the quantity of tin ore sent from Vegetable Creek should be greatly increased.



Adjoining this Company's lands are Messrs. Cadell, O'Daly, & Co's. properties, which have as yet been partly prospected, although a considerable amount has already been expended in shafts and drives in different portions of their ground. Some of their shafts were 110 feet deep, and were chiefly sunk through the same formations that characterise those of the above company's. The bounds of the lead, as shown in plan, are believed to be approximate only, prospecting having not yet been sufficient to determine them with the tolerable accuracy that marks the eastern parts of the lead.


Surface.
3 ft.
Red soil.
45 ft.
Basalt.
In this property the shafts have sunk through from 30 to 90 feet of basalt.
2 ft.
Pipeclay.
15 ft.
Coarse quartz drift.
2 ft.
Drift, with large granite boulders, but no tin ore.
Decomposed granite bottom.

The basaltic range from this point enters into the purchased grazing property belonging to Hugh Gordon, Esq., Strathbogie Station, and runs in a north-westerly direction for a distance of about 3½ miles, where a party of miners took up a mineral lease of 40 acres, having struck the continuation of this lead but only in shallow ground. The sinking is through 5 feet of basalt, 5 and 6 feet of drift, and the wash-dirt immediately under it. The wash and tin ore here is exactly similar to that found at Y-Water and Graveyard Creek, and must without doubt be the same lead. The prospects obtained here were very good; but not much work has been done, as the miners are letting the land lie idle till sufficient rain falls to enable them to sluice out some tin to pay their further prospecting expenses at this place.

The property of Messrs. Hall Bros. & Co., at Kangaroo Flat and at Sugarloaf Mountain, are also spots along this same basaltic belt in which payable tin has been discovered.

Kangaroo Flat I have mentioned in my previous reports, and is about one of the many tin-bearing parts of Vegetable Creek District, which I fairly believe, if a continuous supply of water could be brought on the hills, will be the means of greatly increasing the output of ore yearly obtained from our mines, and prove a source of large revenue to its proprietors, to whom every credit is due for the spirited manner in which they have laid out large sums of money in systematically and thoroughly prospecting this valuable holding.

During the year several hundred feet of drives have been put into the range, and excellent indications of the existence of a large deposit of tin-bearing wash have been found, averaging a depth of about 2 feet, on a soft granite bottom, and about 90 feet from the surface.

The wash-dirt is so cemented together by some clayey substance that it requires puddling before the tin can be extracted, for which purpose a puddling machine is put up, and one of Mr. Wesley's tin separating machines (a detailed description of which I gave in my report for the year 1876) has been erected.

These are so placed in reference to the tunnel that the wash-dirt is trucked out of the tunnel on a tramway by a horse, and is then tipped into the puddling machine, and from thence after being puddled is thrown into the tin separating machine. The managing partner, Mr. Hall, speaks very highly of it, and fully endorses Mr. Wesley's guarantee of extracting, saving, and cleaning the ore properly.

A large heap of wash-dirt is now lying at the slucing appliances, which has been stacked there waiting for the rainfall to fill the dam, and to start sluicing directly after. This heap of wash shows the tin thickly disseminated throughout, and I have been assured that it would wash on an average about 50 lbs. weight of tin to the load.

The limited supply of water here has been the great drawback to this property, which however need not occur again for some time, as a dam has been thrown across the creek which when full will fully meet their requirements for some months.

The Sugar-loaf Mountain is at present lying idle, both on account of the scarcity of water and the low price of tin.

The Surprise Mine situated about 2 miles westerly from the Sugar-loaf, and about 16 miles north-west from Vegetable Creek township, is another spot along this basaltic belt in which really very excellent wash-dirt has been opened out upon. The wash is composed of magnificent water-worn boulders, all as round as pease, up to the size of cannon-balls, to which I can only truly compare them. One half of this property was bought during the earlier part of the year by Messrs. Irby, Andrews, & O'Donnell, for the sum of £700. The mine comprises 200 acres mineral conditional purchase, the greater portion of which is of large hills of made ground, with such an amount of wash that many years' work is insured. At one portion of this property the wash has been actually quarried out, as the men could not do otherwise, the height of the wash being 22 feet, with 2 feet of basaltic formation above it to the surface. The whole depth of wash is carted away a distance of half a mile and sluiced and pays well.

The face or cutting in the hill is about 80 feet wide, with the above-mentioned height of payable wash-dirt; and it is surprising to see the numerous small seams of stream tin running along the bottom part of the face of wash and the whole width. It is indeed a great pity that some capital is not laid out to bring a large supply of water on to this mine, for if sufficient was laid on it for hydraulic mining—(for which method of mining a more suitable spot could not be found, as the hills all round, composed of nothing but a vast amount of wash, are very steep, and the gullies most precipitous would be a good get-away for all the refuse out of the race)—the yield would be surprising. However, this property has at present entirely suspended work on account of the want of water, which want will not be felt after the next rainy season, as under the judicious management of Mr. O'Donnell three large strong dams have been erected in the creek above the mine, and long races to convey the rainfall into them have been cut; so that when once this mine starts to work, I am in great hopes of reporting large results from it.

Payable tin has also been found about 8 miles northerly from this mine and 25 miles north-west from Vegetable Creek, still on the same belt of basaltic formation. A great many tunnels and drives have been put into the base of the hill here (The Springs, property of Messrs. Hall Bros. & Co.), disclosing another large deposit of tin-bearing wash, which however cannot be worked at present, on account of the scarcity of water, but more particularly as the price of tin at the Home market is so low—so that, it will be observed, a belt of country for a distance of 25 miles (which I have no doubt is the extinct river-bed of the present Beardy River, as its waters during the volcanic period found another channel, but now running parallel to the basalt) has been in many spots along its course proved to contain good and payable tin-bearing wash; and it would only require a permanent supply of water, and the tin market to rule a little higher, to permit the owners of the various holdings to start mining operations and prove that the mineral wealth of this district is not yet exhausted in its alluvial mines.

On the mines situated in the immediate vicinity of Vegetable Creek, a great many changes have taken place; one of the most noteworthy changes in the system pursued by the owners of mineral lands is, the almost total cessation of work for wages or a weekly sum as before was the rule, and the introduction of the tribute system in its stead.

Another change, which has been a gradual one, is the encouragement of Chinese labour, and as a natural consequence the influx of a large number of Chinamen from the Cope's Creek and Stanthorpe mines, who have successfully tendered for and received tribute on nearly all the large mining properties here.

Chinamen never were, nor are they here in favour with European miners; but as the latter almost always pave the way for the former on the fields (both gold and tin) by aggressive and absurd demands for high wages, it is easy to guess where the blame, if there is any, should be laid.

A few of the mining proprietors wishing, if possible, to steer clear of the tribute system, are still carrying on, but the rapid fall in the price of tin must settle the question, and the result will be general tribute and Chinamen. The tribute paid per ton of ore varies from £18 to £28, which in many instances leaves a fair margin of profit to the mine owners.

The Great Britain Tin Mining Company have let all their property to various tribute parties, amongst whom about 100 Chinamen find employment. The yield from this mine is 285 tons 17 cwt., which is satisfactory, considering the limited supply of water there has been for sluicing purposes.

The Little Wonder (Messrs. Irby and party) is still keeping up its average yield, as 173 tons of tin were obtained during the year. On this mine also a portion of it has been let on tribute to Chinamen. Messrs. Moore and company's mine is also maintaining its name, as being one of the best tin producing properties here, having yielded 320 tons 3 cwt., with an average of 60 men on wages employed. The owners have been very fortunate as regards the supply of water for mining, a very large dam having been constructed across the creek with the tailings and hopperings from the sluicing appliances, which has preserved sufficient water to tide them so far through the drought without very much feeling its effects.

One half of the Baal Gammon Mine changed hands during the year for the sum of £100 sterling, the lucky purchaser of which repaid himself during the first three months after the sale. This claim is paying excellent wages to the party of working men who now own it.

The Nonpareil has ceased all work for the last nine months, from scarcity of water.

Messrs. Hall Bros. & Co.'s Vegetable Creek Mine yielded 80 tons, and is very ably and systematically worked. The adjoining mine down the creek-bed, the Rothschilds (280 acres, mining conditional purchase), has been purchased from the original proprietors by Messrs. Moore and party for the sum of £3,000, and is an instance that local speculators still have faith in the tin producing properties of Vegetable Creek.

The Six Mile, Hall Bros. & Co., has been let on tribute to Chinamen, who have obtained during the year 40 tons of tin. The next mine (Gordon's), having been abandoned by the owners, has been taken by several parties of miners under the Mineral License Regulations; the want of water prevents them from doing very much work, but they seem quite satisfied with their prospects.

The Vegetable Creek Tin Mining Company's (Limited) mine, J. J. O'Daly manager, is at present not worked, excepting some surfacing, their dams through the present prolonged drought being nearly dry.

The company intend letting all their old claims on tribute to Chinese miners, and have already 35 Chinamen working out the surfacing at a price which leaves a satisfactory profit.

The original Deep Lead, from which 1,976 tons 13 cwt. of tin ore have been raised, will also probably be let to Chinese tributors, the proprietors finding that course far more profitable than employing European miners at a high rate of wages when the price obtainable for the metal is so depressed.

During the year the company have been vigorously prosecuting their search for the continuation of the run of the lead in a south-westerly direction, and have found channels at depths below the surface varying from 65 to 80 feet, but nothing as rich as the first main deposit has been struck.

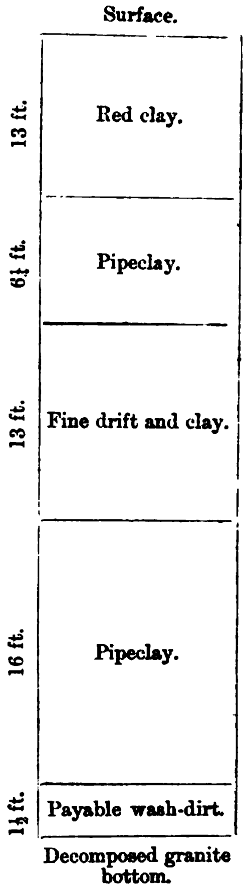
It is possible that this old lead has traversed the property and effected a junction with the Y-Water and Graveyard Deep Lead at a point about 60 chains east of portion 180; and, if the glacial theory is correct, this might be possible, as an opening may then exist in the depression that occurs at that spot in the granite range bounding the northern side of the present Graveyard Creek. But the more favoured view taken is, that the old lead (Vegetable Creek Tin Mining Company's) is throughout its whole course for some miles below this point separate and distinct from the newly discovered Graveyard Lead; that the old lead passes through the property held by Mr. W. H. Wesley in a north-westerly direction from the first main deposit, and passing through that ground and the adjoining western blocks of the Vegetable Creek Tin Minining Company's lands, went westward and ran into the Graveyard Lead miles on in its course; that thence the united lead formed Messrs. Brown's Three-Mile Creek, Hall & Co.'s Kangaroo Flat and Sugar-loaf Mountain Leads, and also the wonderful deposit at Messrs. Irby & Co.'s Surprise Mine, 15 miles from Vegetable Creek, as well as the lead discovered at Springs, Rocky Creek, 25 miles from here, and the continuation of the run of basaltic country to far beyond the centre, about the western boundary of the Vegetable Creek Tin Mining District,—were all one and the same water-course, formed by the junction of the old Vegetable Creek Deep Lead with the Graveyard Deep Lead; and that the lead becomes rich and poor in tin ore alternately, as the flow of water or the glaciers whichever it might have been passed over tin bearing reefs or through country in which that mineral did not exist in the matrix.

If we do not accept the glacial theory, it is hard to account for the wide and extensive water-courses, and the vast accumulations of drift and gravel, we find close to the sources of the extinct streams, which the rivulets from the gullies in the mountains would scarcely have caused. No indisputable traces of the Ice Age have been discovered, such as striated stones or rocks, as far as I can learn, but this may be accounted for by the fact that the "bottom," wherever the deep lead has been worked, has been almost invariably decomposed granite, from which such traces would have been easily obliterated. The stones found in the deposits are generally of the same nature, with the exception of quartz and other pebbles, and particularly black quartz stones, which are almost invariably found where the deposit is payable, especially near the sources of the lead. A reef of this black quartz crops up in Mr. Campbell's mineral block, north of the Vegetable Creek Tin Mining Company's old rich deep lead, and has been traced in a south-westerly direction for a distance of more than half a mile through that company's lands, to a spot where it again appears as a well defined reef. Most of this land is still untried, and some very rich discoveries remain yet to be made.

As before stated, the ground adjoining the Vegetable Creek Tin Mining Company's land on the north-western side, and on one of the assumed courses of the original deep lead, is Mr. W. H. Wesley's 180 acres mining conditional purchase.

This Mr. Wesley is systematically prospecting, having sunk 9 shafts, varying in depth from 50 to 95 feet, and driven in various spots from the shafts over 190 feet. The several shafts sunk have gone through a volcanic formation of different changes; in one instance a shaft was sunk through 70 feet of hard rock, in others only a few feet, with bands or small veins of ironstone, and a deposit of pipeclay on a soft granite bottom.

The tin ore is mostly on the bottom, the really good wash being about 4 inches thick. There have been drives driven across the run or lead of wash about 40 feet, when the high rock on the north side was struck. The section of a shaft given is of the last one sunk, and the most northerly one on this property.



A drive has been driven easterly about 12 feet, showing the tin-bearing wash very rich in places, but the principal mass remains yet to be discovered, although Mr. Wesley is convinced that he is now on the right run, and that a few more months will see his energy rewarded with success.

The sections held by the Vegetable Creek Tin Mining Company, 280 acres, south and west of Mr. Wesley's ground, have not yet been tried, as the company will be guided in some measure by the results achieved by that proprietor; but should Mr. Wesley's ground prove as rich as he anticipates, these 280 acres will be a valuable property.

The Rose Valley deep lead has been let by Messrs. Irby and party on tribute to Chinamen, who however have not yet been able to make wages on account of the scarcity of water.

Operations on the Glen and Tent Hill Creeks are carried on by a few miners, who are steadfastly holding on to their claims, in the hope that when rain comes their labour will be amply rewarded.

Prospecting for alluvial and lodes has been carried on very spiritedly on the Mole Table-land, and only in a few instances the miner's industry has been rewarded with some success.

Several of the large swamps or marshes at the heads of the larger creeks have had some little attention paid to them; so since this prolonged drought the men have been able to bottom a few holes at the lower end of them, from which good prospects were obtained; but on sinking higher up the swamps, the difficulty in keeping down the water, in the absence of proper pumping gear, was so great that the men had to knock off work. Many of the old inhabitants of Mole Table-land even go so far as to affirm that if the water could be got under, good and rich deep runs of tin will be found through these flats, because all the gullies heading into the swamps have in a good many cases proved payable, and payable tin has been worked at the lower end of them. In one instance a shaft was sunk 27 feet through drift and sand, in Trollope's swamp, but the water and sand running in beat out the men before they could bottom. My belief is, that deep ground at the Table-land will prove barren; but if payable tin is found, it will open up a vast area of ground on the swamps and marshes at the heads of the large creeks—such as Trollope's Swamp, Blather Arm, Black and Paradise Swamps, and also at Wyndham's Swamp, Bald Rock Creek, &c.—the value of which is as yet unknown.

There are a few energetic proprietors of lode-tin land here—who are determined at all hazards to thoroughly try the lodes, and the tin stone already raised warrants the expenditure of a little capital—the most prominent of whom are Messrs. Stuart and Watt, of Sydney, the owners of 140 acres lode-tin land at Silent Grove, situated about 14 miles northerly of Mole Table-land and 32 miles north-west from Vegetable Creek.

At present a shaft is being sunk, and at a depth of 30 feet; the lode appears to be about 2 feet wide, a seam of tin about 2 inches thick being in the centre, the quartz at both sides having good tin all through it. The proprietors have bought a crushing machine with 10 head of stamps, replete with all the latest improvements for extracting the ore from the stone, which is now in the course of erection; and the manager (Mr. Henderson), has every hope of trying the value of the lodes in this property, by the test of the stampers, in the course of a couple of months if rain comes. The machine is capable of crushing 15 tons of quartz daily, and has been most substantially erected under a very large bark shed.

There are three tin-bearing lodes in this land, which are situated about a mile distant from each other, are parallel, and run about north-east and south-west.

The granite appears to be more settled in Silent Grove than in any other portion of this district where lodes occur, which is easily explained by the fact that Silent Grove has been proved by aneroid to be about 1,150 feet lower than Mole Table-land.

A large extent of alluvial ground, proved payable, and situated about 1 mile from the crushing machine, has been taken up by the Company.

The Dutchman's lode is situated about 12 miles north-east of Vegetable Creek, and on which only two blocks of 20 acres each have as yet been taken up. The indications here are very good, only one trial-shaft having been sunk. A few surface holes have also been put down, disclosing the run of the lode, which is north-east and south-west, and to prove the existence of tin ore. The shaft is down only a few feet, yet it shows the cap of the lode to be fully 6 feet wide, but apparently at the bottom of the shaft the lode is divided into two legs.

The quartz is richly charged with tin ore, and has well-defined walls of soft granite, so although it is impossible to say from what little work has been done if it will prove a permanent lode, still the prospects are very encouraging, and should induce the owners to invest a little capital on their land to more thoroughly try the lode.

Byrne's reef, situated about 2 miles north-east of the Dutchman's lode, has two shafts sunk about 40 feet each, showing the cap of a well-defined lode between soft granite walls, which from the indications may settle down into a good payable lode. The cap of the lode is several feet through, and tin ore is thickly diffused in the stone. This lode also runs north-east and south-west, and is also very well worth expending more capital on. At present the owner is letting it lie idle.

Messrs. Elliott and party applied for 20 acres of land under mineral lease, on which very promising indications of a tin lode existed. So far, no great depth has been reached by the men employed, but the work done gives them confidence that a payable lode will be discovered. Very good prospects are obtained from the stone about 12 feet from the surface, the lode having gradually widened out to 2 feet at that depth. An open cutting about 6 feet long discloses the run of the lode, which is about north-east and south-west. The quartz thrown out from here also has tin well through the stone. The granite on either side is rather hard, but shows very fair walls. The stone when calcined is easily crushed, this method having been tried by the proprietors; and the prospects they obtained in this manner have given them every confidence of this lode yet repaying them for all labour and time expended.

Very great excitement was caused at another portion of this district, by the discovery of an extremely rich lode or dike of nearly pure tin ore on the Gulf Steam Company's leads, portions 59 and 60, situated at the Gulf Creek, 24 miles north-west from Vegetable Creek, by a party of men who had been prospecting about that locality. The two or three men after obtaining 27 tons of tin from this dike in about four or five months by means of crushing the tin-stuff, which was quite soft, with hand-dollies, were turned off the land by another party of six or eight men, who jumped it on the grounds of prior right of application.

This party raised about 60 or 70 tons of ore during the months of March, April, and May, when the original lessees, who were residents of Sydney, put in their claim to the land, by virtue of leases for these blocks having been granted and executed by them in July, 1872.

After a great deal of delay and a troublesome lawsuit Messrs. Banks and party obtained possession of their land, on which they at once started to work in a proper and systematic manner. The open cutting from which the men had dug out the 80 or 90 tons of tin was filled up, and a shaft started, when, at a depth of 36 feet from surface, the lode or dike of tin pinched out like a wedge. From this level a drive was put in a distance of 127 feet along the course of the lode, which averaged a width of 3 feet, and was stoped out overhanded to within 5 or 6 feet of surface, where it again run out in the shape of a wedge; and from the whole of this space worked out 229 tons of tin were raised, besides the large heap of tin stuff now on surface which the manager reckons will produce more than 40 tons of ore when he has sufficient water for sluicing; so that from this mine every cubic yard worked out has yielded the enormous quantity of about 16¾ cwt. of clean tin ore.

The run of this wonderful deposit of tin was about east and west, and enclosed in very soft granite. The strike of the rock on either side was north-east and south-west.

Another shaft is now being sunk westerly of the old one, and at the end of the long drive, in which this lode of tin is again making, and is at present about 1 foot wide, and nearly as rich as ever.

A Chilian mill has been erected close to the sluicing appliances, into which the tin stuff is thrown and crushed, and from thence taken in a wheel-barrow to the sluice-box, where it is only streamed. A large tin store has also been built convenient to the washing-place.

This company have produced from this lode, since it was restored to them in June last, 132 tons of tin, and would have very considerably increased that yield if the supply of water had not been exhausted so soon. Messrs. Banks and party have a splendid property here; but no effort sufficient to develop it at a depth has been made, which if done would not only without doubt enrich themselves, but also greatly benefit the district.

The discovery of this extraordinary rich lode has given a wonderful impetus to mining at the Gulf, where previous to this only about fifteen or twenty men eked out an existence by fossicking; this locality now supports about 120 persons, a good many of whom are carrying on prospecting spiritedly with every appearance of success.

Messrs. Hall and party have taken up a mineral lease of 20 acres on a lode situated about 3 miles south-west from the Gulf Stream Co. The specimens brought in from there show very rich in tin. The rock, however, is very hard, and it is the intention of the owner to let the shaft be sunk on contract, and that at once. This lode runs north-east and south-west.

Messrs. Gaden and party have also applied for a large area of mineral lands at the Gulf, in one block. The proprietors are very sanguine of striking a good lode, as all the tin found has been all heavy lode tin, little if any water-worn, and in many cases actually attached to portions of quartz, showing that it had recently been detached from the reef where it had been formed. They have already a shaft down about 27 feet, which has been done on contract.

There are also some men engaged by Messrs. Thomas Reynolds and party, on 280 acres mineral lease, situated northerly of the Gulf Steam Company's land, on wages, who are at present sinking on a lode which produces some very good specimens of tin ore, and eventually this may become a valuable property.

There is no doubt if the present work is continued that portion of the district will be well prospected; all that I fear is the heavy amount of capital it will take to thoroughly prospect. When the first 50 feet costs at the rate of £1 10s. to £2 per foot, prospecting becomes an expensive affair, and one not to be entered upon without consideration.

Some tin stone was found between Flagstone and Paradise Creeks, 7 miles east of the Gulf. The prospectors applied for 40 acres under mineral lease, which was also claimed by another party, who at the same time obtained the Secretary for Mines' injunction to stop the prospectors from working till their claim could be settled. An inspection of the workings, and an examination of the stone, did not impress me very favourably, for as far as I could see no defined lode existed there, and I do not anticipate any important results from the discovery.

Messrs. Heiser and party have also some mineral land (40 acres) about 2 miles north-west of the above mentioned locality—on Flagstone Creek. A lode has been discovered showing good tin all through the stone, at a depth of 20 feet from surface, with a width of 2 feet. This lode runs north-east and south-west, and occurs in rather hard granite rock. This party of miners have always been sanguine of success when sinking for the lode, they had not obtained any rich specimens of lode tin on the surface to warrant them to sink a shaft, but they had great faith in a large blow of white barren quartz which cropped up along the top of the range on which they worked, and their perseverance and industry have been rewarded with a rich prospect.

This result has given fresh heart to the miners, who are working on several lodes, and will, doubtless, hasten the development of the lodes in this district.

A parcel of land embracing 200 acres, and in which is a lode supposed to be one of the best in the district, has been taken up by Messrs. Cadell, Hall, & party, and situated at the very head of Flagstone Creek, about 8 miles northerly of Messrs. Heiser & party, and 25 miles north-west of Vegetable Creek. The lode is large, and some remarkably rich specimens obtained from the Land were shown to me. The proprietors intend working this land immediately their title to it has been granted. This lode also runs north-east and south-west. It is a most noticeable feature in all the lodes so far discovered, that they all have the same bearing all over the Vegetable Creek Mining District; the run of the granite rock in which they occur is also similar.

The Gulf not only possesses rich lodes, but in alluvial that portion of the district bids fair to rival the alluvial claims in the bed of Vegetable Creek in richness.

Messrs. Wheeler and party have taken up 60 acres under mineral lease, at the bottom of Deep Sinker's Creek, situated at the Gulf, and highly satisfactory prospects are obtained over their land.

The sinking so far is shallow, and payable tin is found at depths varying from the roots of the grass to 15 feet. Some of the wash I saw panned out yielded from ½ lb. to 2 lbs. weight of tin to the dish. The tin is coarse and very much water-worn, and the wash is composed of white quartz drift with no stone or pebbles; but large water-worn granite boulders lie on the bottom, which is soft granite.

This claim is only just being opened out, and it is expected when deeper ground is reached valuable and regular leads will be discovered.

To give a general idea of the state of mining matters in this district during the year 1877, I may observe that the total collections for that period amount in all to £900 5s.,—which compared with the collections of 1876, amounting to £460, shows a marked increase. 2,761 acres of mineral lands were applied for through this office, and 101 mineral licenses were issued during 1877, as compared with 1,360 acres of mineral lands applied for and 45 mineral licenses issued in the year 1876—which figures show without doubt that tin mining industry in this district is steadily and rapidly improving.

The total number of tons of tin ore raised in Vegetable Creek Tin Mining District, from the year 1872 (discovery of tin) to the 31st December, 1877, was 12,641 tons 7 cwt. A tabular form giving the yearly yields for that period from all the various mining properties and localities in this district is attached herewith.

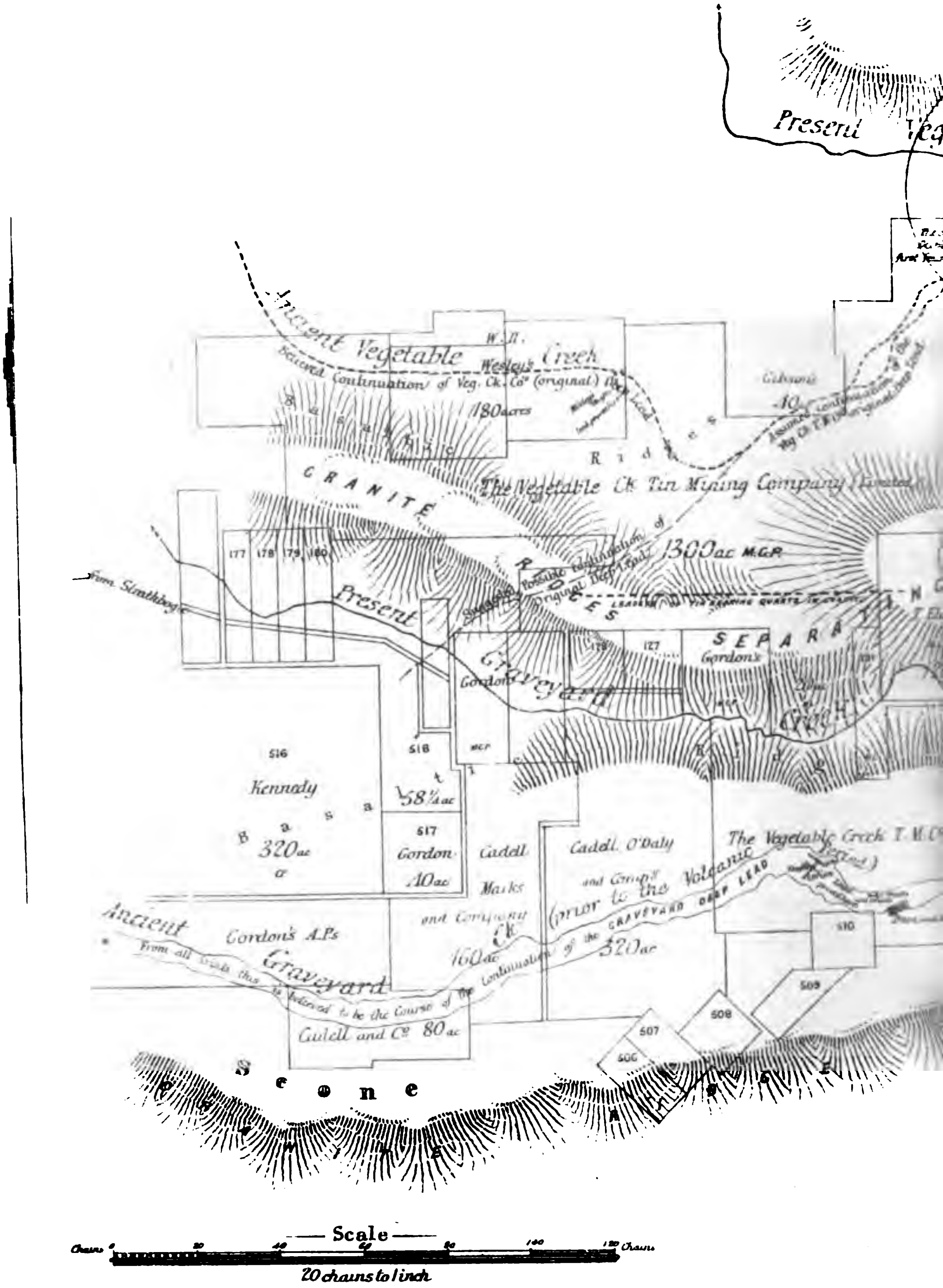
PL

of Lands containing deep

PARISHES OF STR

COUNTY o

Particularly intended to show the recently developed deep lead



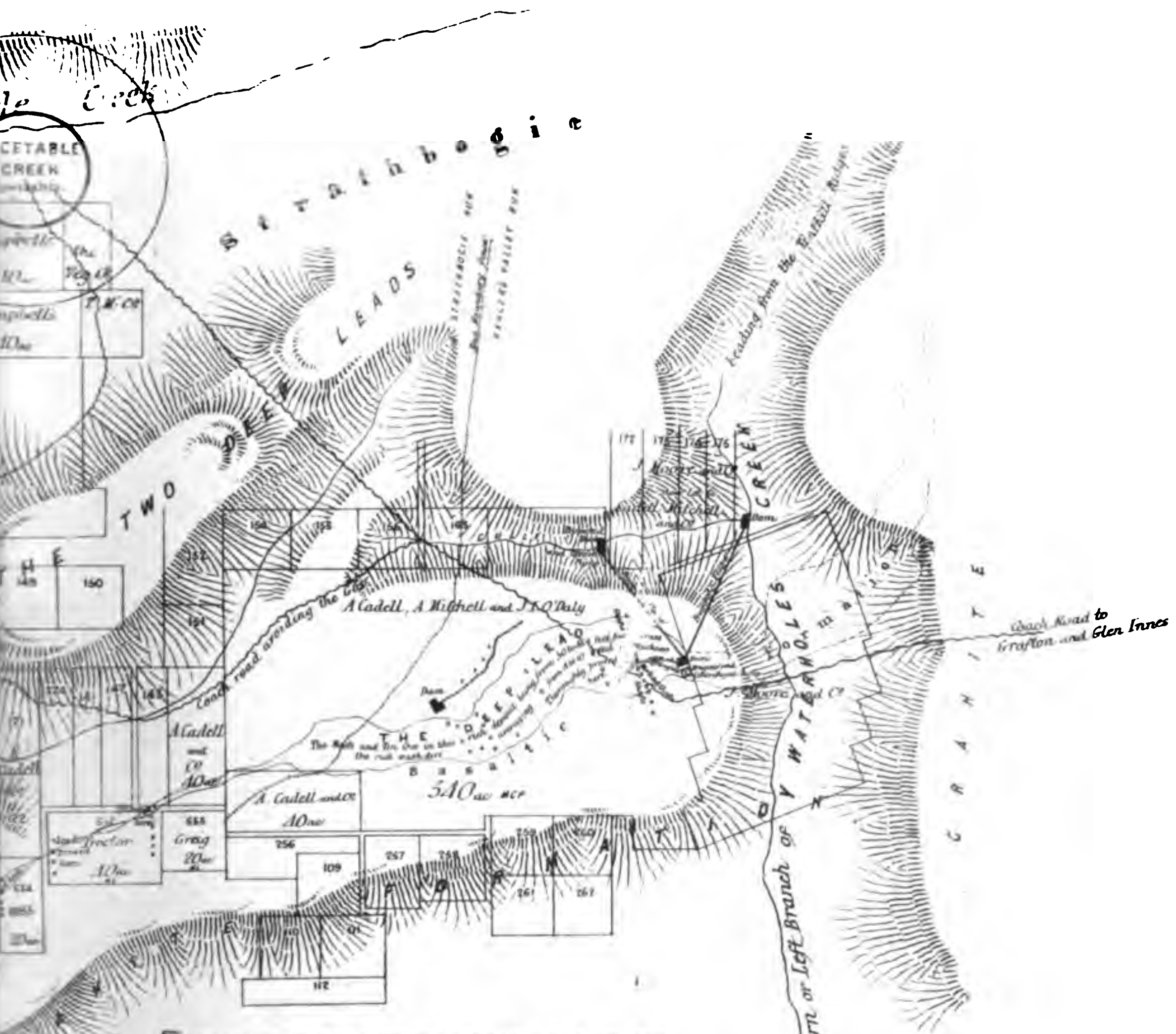
Present Veg
Ancient Vegetable Creek
Second Continuation of Veg. Ck. Co (original) Deep Lead
W. H. Wesley's
180 acres
Gibbons 40
Assumed continuation of the Veg. Ck. T. M. Co original Deep Lead
Basaltic
Ridges
GRANITE
The Vegetable Ck Tin Mining Company (Limited)
1300 ac M.C.P.
RIDGES
Supposed possible continuation of Original Deep Lead
From Strathbogie
177
178
179
180
Present Graveyard Creek
SEPARA
Gordon's
Gordon's
128
127
MCP
516
Kennedy
Basalt
320 ac
518
58¼ ac
517
Gordon
40 ac
Cadell Marks and Company
Cadell O'Daly and Company
160 ac
The Vegetable Creek T. M. Co (Limited)
Ck (prior to the Volcanic) continuation of the GRAVEYARD DEEP LEAD
320 ac
Ancient Gordon's A.P.s Graveyard
From all trials this is believed to be the Course of the
Cadell and Co 80 ac
510
509
508
507
506
Stone
Scale
Chains 0 20 40 60 80 100 120 Chains
20 chains to 1 inch

[illegible] in the

BOGIE & SCONE........

UCH.

n as The Y Water and Graveyard Ck Deep Lead



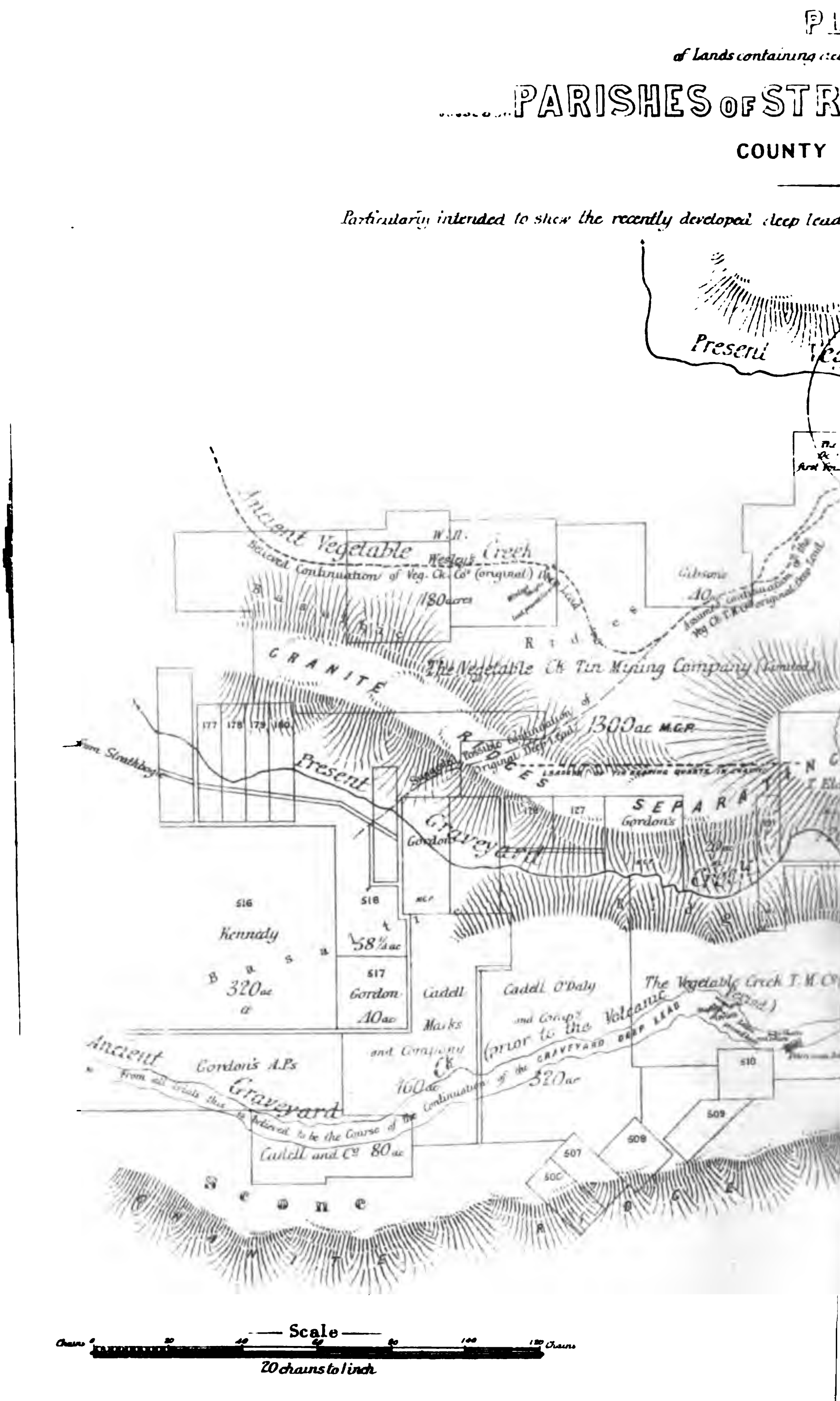
NOTES

Shafts are marked thus ∗, but only a few of those sunk are shown

The width of the Lead is approximately correct through Messrs Cadell Mitchell and Company's Lands (540 ac MCP), being thoroughly prospected and workings surveyed; as also a large Area of the Vegetable Creek Tin mining Company's ground on the same Lead

Webb's and Proctor's Sections have also been proved to contain the continuation of this Lead, but the remaining Portions, westward of the Vegetable Creek Tin Mining Company's Land, have not been sufficiently prospected, to determine the continuation of the Tin deposit there.

PHOTO-LITHOGRAPHED AT THE GOVT PRINTING OFFICE
SYDNEY NEW SOUTH WALES

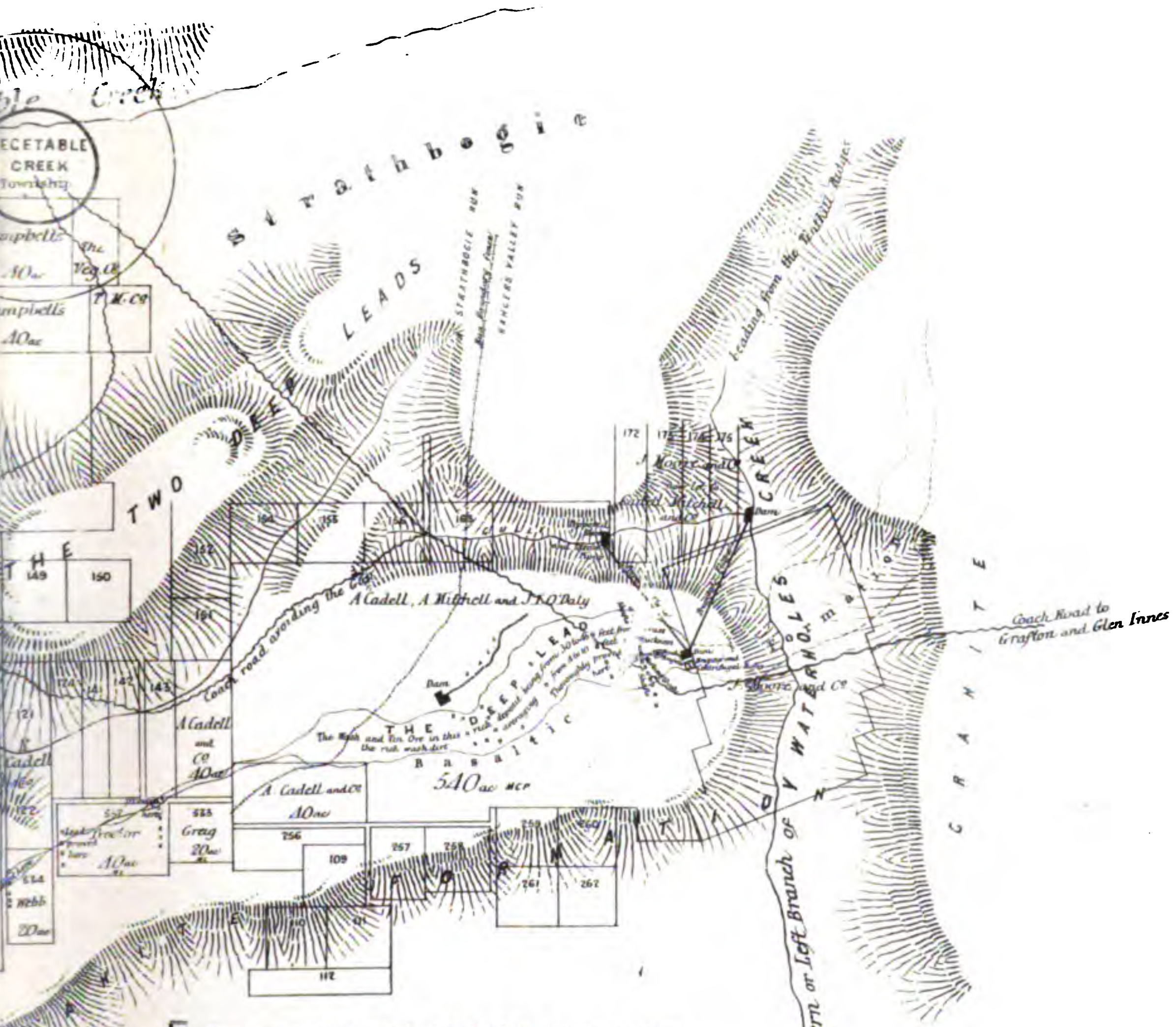

PL
of Lands containing
PARISHES OF STR
COUNTY
Particularly intended to show the recently developed deep lead
Present
Ancient Vegetable Creek
W.N.
Wesley's
Second Continuation of Veg. Ck. Coy. (original) Deep Lead
180 acres
Gibsons
40
Assumed continuation of the Veg. Ck. T.M. Co. original Deep Lead
Ridge
GRANITE RIDGES
The Vegetable Ck. Tin Mining Company (limited)
1300 ac M.C.P.
From Strathbogie
177
178
179
180
Present
Graveyard
SEPARATION
Gordon's
Gordon's
127
516
Kennedy
320 ac
518
58¾ ac
517
Gordon
40 ac
Cadell
Marks
and Company
160 ac
Cadell O'Daly
and Company
Prior to the Volcanic
Continuation of the GRAVEYARD DEEP LEAD
320 ac
The Vegetable Creek T.M. Co.
Ancient Graveyard Ck.
Gordon's A.Ps
From all indications this is believed to be the Course of the
Cadell and Co. 80 ac
510
509
508
507
506
Scone
GRANITE RIDGE
Scale
Chains 0 20 40 60 80 100 120 Chains
20 chains to 1 inch

ts of Tin Ore in the

HBOGIE & SCONE........

OUCH.

known as The Y Water and Graveyard Ck Deep Lead.



NOTES

Shafts are marked thus •, but only a few of those sunk are shown

The width of the Lead is approximately correct through Messrs Cadell Mitchell and Company's Lands (540 ac MCP), being thoroughly prospected and workings surveyed; as also a large Area of the Vegetable Creek Tin mining Company's ground on the same Lead

Webb's and Proctor's Sections have also been proved to contain the continuation of this Lead, but the remaining Portions, westward of the Vegetable Creek Tin Mining Company's Land, have not been sufficiently prospected, to determine the continuation of the Tin deposit there.

PHOTO-LITHOGRAPHED AT THE GOVT PRINTING OFFICE
SYDNEY, NEW SOUTH WALES

One thing may be relied upon, and that is that slowly and surely is Vegetable Creek becoming enriched with numbers of discovered good tin lodes; and it may fairly be predicted, that when they have received that attention which their richness entitles them to, there will be a very large population attracted to this neighbourhood by the certainty of permanent employment for many years.

THE total yield of Tin Ore from the Vegetable Creek Division, New England and Clarence Mining District, from the commencement of mining operations, in the year 1872, to the 31st December, 1877.

Name of Company or Mine.	Locality.	Yield of Tin Ore during					Total yield from each mine or locality from 1872 to 1877.	Total.
		1872 & 1873.	1874.	1875.	1876.	1877.		
		Ts. cwt. qrs.	Ts. cwt. qrs.	Ts. cwt. qrs.	Ts. cwt. qrs.	Ts. cwt. qrs.	Ts. cwt. qrs.	Ts. cwt. qrs.
DEEP LEADS.								
The Vegetable Creek Tin Mining Company (Limited.)	Vegetable Creek.	103 19 0	234 0 0	741 12 0	715 18 0	181 4 0	1,976 13 0	
Campbell & Gibson's Mine (Cates' Tribute.)	,,	......	......	......	217 0 0	......	217 0 0	
Rose Valley (Irby, Andrews, & O'Donnell.)	,,	127 0 0	40 0 0	......	55 12 0	......	222 12 0	
Kangaroo Flat (Hall Bros. & Co.)	,,	10 0 0	50 0 0	....	3 10 0	28 0 0	91 10 0	
The Springs ,, ,,	,,	6 0 0	10 0 0	......	......	......	16 0 0	
Surface Hill (Lewis & others)	,,	......	......	40 0 0	......	......	40 0 0	
Wm. Proctor & party	,,	......	......	......	......	9 0 0	9 0 0	
Surprise Mine, Mount Look-out (Irby & party.)	,,	......	......	15 0 0	17 0 0	16 10 0	48 10 0	
Total yield of Tin from Deep Leads, 1872 to 1877......	......	......	......	......	......	......	......	2,621 5 0
SHALLOW WORKINGS (CREEK CLAIMS.)								
The "No Mistake" Mine (Campbell & Gibson.)	,,	30 0 0	80 0 0	80 0 0	4 0 0	10 10 0	204 10 0	
The Great Britain Tin Mining Company (Limited.)	,,	28 0 0	120 0 0	431 0 0	547 9 0	285 17 0	1,412 6 0	
Tomison's (now the property of the Great Britain Company.)	,,	85 0 0	70 0 0	......	......	......	155 0 0	
Little Britain (formerly Ashton's.) } Now the property of Irby, Andrews & Co.	,,	20 0 0	100 0 0	105 0 0	126 2 0	81 0 0	432 2 0	
Little Wonder (formerly Maund & party.)	,,	95 0 0	65 0 0	139 0 0	133 2 0	92 0 0	524 2 0	
Moore & party, Messrs. (including field of Little Minnie mine.)	,,	334 0 0	410 0 0	450 0 0	300 0 0	320 3 0	1,814 3 0	
Baalgammon (Lee & others) ..	,,	240 0 0	120 0 0	180 0 0	117 2 0	61 3 0	718 5 0	
Nonpareil (Marshall & others)	,,	316 0 0	150 0 0	122 0 0	51 2 0	21 0 0	660 2 0	
Vegetable Creek Mine (Hall Bros. & Co.)	,,	230 0 0	120 0 0	80 0 0	78 0 0	80 0 0	588 0 0	
Rothschild's (Hansen & others)	,,	150 0 0	110 0 0	115 0 0	85 0 0	62 10 0	522 10 0	
Six-mile (Hall Bros. & Co.)....	,,	90 0 0	80 o 0	60 0 0	36 0 0	40 0 0	306 0 0	
Gordon's (Hamilton Gordon) ..	,,	38 0 0	40 0 0	80 0 0	5 15 0	14 10 0	178 5 0	
Tent Hill (including Hall & Co., Moore & Co., and other companies.)	,,	195 0 0	60 0 0	50 0 0	46 0 0	15 0 0	366 0 0	
Tent Hill Creek (including M'Master's, 147 tons)	,,	107 0 0	40 0 0	10 0 0	37 0 0	8 0 0	202 0 0	
Glen Creek (including Banca, Glen Lode, and other Companies.)	,,	46 0 0	70 0 0	49 0 0	38 0 0	21 0 0	224 0 0	
Gulf Creek (including Gulf Stream Co., Hetherington & Co.)	,,	72 0 0	50 0 0	75 0 0	62 0 0	232 0 0	491 0 0	
Mole Table-land (approximately)	,,	200 0 0	80 0 0	100 0 0	73 0 0	50 0 0	503 0 0	
Y-Water-holes Creek (including Brown's and other M. L's., Graveyard Creek, and Big Ben.)	,,	34 0 0	50 0 0	80 0 0	77 12 0	14 10 0	256 2 0	
Y-Water-holes Creek (Moore & Party's property on Tribute.)	,,	15 0 0	......	......	155 10 0	105 5 0	275 15 0	
Grampian's (Hall Bros. & Co.)	,,	20 0 0	100 0 0	40 0 0	27 0 0	......	187 0 0	
Total yield of Tin from shallow workings, 1872 to 1877..................	......	......	......	......	......	......	......	10,020 2 0
Total......	......	2,591 19 0	2,249 0 0	3,042 12 0	3,008 14 0	1,749 2 0	12,641 7 0	12,641 7 0

NEW ENGLAND AND CLARENCE DISTRICT.—DALMORTON DIVISION.

(*W. F. Poole, Mining Registrar.*)

THE past year has been fraught with disaster to the mining industry in my division, owing to the collapse of the Clarence Pioneer Quartz Mining Association. In the early part of the year it was expected that a great impetus would be given to mining pursuits, and that most of the abandoned leases and claims known to be auriferous would be retaken and worked to the advantage of the owners and the district in general.

A company, "C.P.Q.M. Co.," was formed for the purpose of cutting in the Tower Hill Co.'s shaft, the Perseverance Reef, at a depth of 250 feet. It was proposed to commence at Reardon's claim and drive a tunnel along Webb's Line of Reef to the supposed junction with the Perseverance in the Tower Hill shaft. As the lowest crushing from Reardon's claim had yielded 13 dwts. per ton, the shareholders were led to believe that instead of having to pay calls they would have the pleasing duty of receiving dividends. The first crushing however dispelled their illusions, as a parcel of nearly 100 tons yielded only about ½ dwt. per ton. An earthquake could not have caused more consternation than did the report of this yield. All kinds of surmises were afloat. Some thought the machine lost the gold; others that the gold was not in the stone. A meeting was called, and it was resolved to take out another small crushing; this was a little better than the first, as it brought up the average to nearly ¾ dwts. per ton. All hopes of an immediate improvement having thus been dispelled, shareholders became disgusted and refused to pay up their calls. Several meetings were called but no steps taken to either continue operations or pay up the arrears of expenses. I have therefore advised the Warden to call upon the lessee to show cause why the lease should not be cancelled.

It is a matter of deep regret that this company has been so unfortunate, as the lessee of the claim, Mr. John Frazer, also owns the only crushing plant now on the ground, and if through the failure of this company he should see fit to remove the machine it would retard the development of the other reefs in the district.

A parcel of 28 tons has been crushed from the prospector's claim, Perseverance Reef, for yield of 4 ozs. 11 dwts.

The old prospector's claim, Liberator Reef, has been re-opened, the spirited proprietors of which have now about 70 tons of stone at grass. Great difficulty has been experienced by this party in getting their stone to the mill. The mine is situate on the top of a high range on the southern side of the Little River, very difficult of access, and teamsters do not care to risk their horses' lives even at the tempting offers held out, viz., 15s. per ton for a distance of 3½ miles. However, they expect to have all their stone at the mill in a few days, when crushing will commence. It is expected to yield over 1 oz. per ton.

The Homeward Bound Company, 7 miles east of Dalmorton, crushed 44 tons for a yield of 16 ozs. It is believed that this reef would give handsome returns if a crushing plant were erected on the ground, as the expense incurred for carting alone would give good dividends. The stone is easily got, and the average width of the reef 18 inches.

Two tons of stone have been crushed from the prospector's claim, Scottish Chief, for a yield of 2 ozs. or 1 oz. per ton. This reef is situate about 8 miles north-east of Dalmorton, on the top of a high range dividing the Mann and Little Rivers. Owing to the great difficulty and expense of getting the stone carted to the machine, this promising reef is abandoned, as are also others on the same range; amongst the number may be mentioned the Pioneer, Ben Bolt, Victoria, Chieftain, and Heather Bell, some of which yielded as high as 2 ozs. per ton.

At the present time only six men are employed on alluvial workings. The yield of gold from this source for the past year I estimate at 150 ozs.

A silver mine is supposed to exist in the neighbourhood of the Mann River, but the prospectors refuse to give any informanion respecting it at present.

NEW ENGLAND AND CLARENCE DISTRICT—LUNATIC DIVISION.

(*M. J. Synge, Mining Registrar.*)

I have the honor to furnish you with my Annual Report of the Lunatic Mining District to the end of the year 1877.

There has been a falling off in the gold won in the district in consequence of the severe drought, extending through the whole of the year, no water for sluicing or crushing purposes being available.

The amount of gold won in the immediate neighbourhood of Tooloom, Pretty Gully, and Lunatic Reef, has been, *vide* storekeepers' report, 874 ozs. 17 dwts. 18 grs., which is a falling off from last year.

At M'Leod's Creek the miners are chiefly Chinese. These diggings continue the same as when I last reported on them.

At Lunatic three claims have been at work for most part of the year. The stone raised and crushed has been about 120 tons, giving profitable returns. About 80 tons now raised is expected to give a profitable return.

At Pretty Gully there are still about the same number of men as I reported last year, but the work of sluicing is retarded for want of water.

At Timbarra, Poverty Point, very extensive works are being carried out in connection with a claim known as the Surface Hill Ground Sluicing Company. Large returns are expected as soon as rain comes. A number of claims have also been taken up at Boorook. A machine of three stamps has been erected; it also at a stand-still for want of water. Altogether the miners here appear satisfied and confident when rain omes the returns from the quartz and wash-dirt raised will be satisfactory.

There have been taken up here two blocks of 20 acres each to mine for *antimony*; six men are employed. They have already sent away to Sydney 47 tons of the ore, which I believe gave profitable returns. The width of the lode is 1 foot, in good country, and the supply seems plentiful. There has also been taken up at Pretty Gully a 20-acre block for antimony which report describes as rich ore with a good width of lode.

At a place called Slaty Creek a quartz reef has been opened, a number of ounces have been taken out of it by hand crushing. A trial crushing of 4 tons gave at the rate of 1 oz. 7 dwts. to the ton, not picked stone, which they say will pay when when they get their own machinery on the ground. About 100 tons have been raised and are now awaiting machinery which is expected to be erected shortly. I have no account of the gold won at Timbarra, M'Léod's Creek, or Slaty Creek.

Bedwell and Hollingdale had 8 tons crushed from their claim, No. 1 Golden Crown Reef, result 40 oz.; depth from surface 25 feet. From No. 2, Golden Crown, Salmond and party had crushed 32 tons, result 58 oz. In all, there have been about 100 tons crushed this year, and about 90 tons awaiting crushing.

The prospectors on the Perseverance Line of Reef, May and Thomson hand-crushed 61 lbs of stone, and obtained therefrom 64 ozs. of gold. They also have 20 tons raised awaiting crushing. J. Hooton and Son, on the No. 2 Line of Reef, Golden Crown, have had several rich hand-crushings. They also have 6 tons awaiting crushing. The gold in both reefs has been obtained north and south; depth, 2 feet to 40.

The Shoobert Mining Company, on the Lunatic Line of Reef, has been at work continuously all this year; but have had no crushings. They have about 35 tons of stone awaiting crushing when they can obtain a plentiful supply of water.

The abandoned antimony mines at Lunatic Reef are at work again. The company who own the mine are called the Hercules Smelting Company of Sydney. The Manager has sent 37 tons to Sydney, and more ready to go when carriers can be obtained. There has also gone 1 ton to Sydney from Ball and Smith's antimony mine, at Pretty Gully; report says it is very pure, and 1 foot wide.

Timbarra—There is not much doing owing to the continued drought. I am informed the Donald Grey Reef was a failure, therefore the machine was removed. M'Leod's Creek: There are a few Europeans and Chinese sluicing the old workings. At Pretty Gully there is no change from last year, the quartz reefs still idle. At Lower Tooloom there has been a small rush to a place called Paddy's Gully. The sinking is 20 feet; and some, I hear, get 7 dwts. to the load. The race at Tooloom has been discontinued owing to disputes among the party. There are four machines in this division, and only one has been at work this year—the machine belonging to Shoobert & Co.

There are about 120 European miners, and 36 Chinese. There may be a great many more, but that is as near as I can tell.

Richard Hooton & Co. had 33 tons of stone crushed, which returned 38 ozs., from the Hollingdale and Co.'s abandoned lease. I have not got in the returns of gold yet; but will let you know when I do. There are six men at work in the antimony mine, and more will be put on after Christmas.

NEW ENGLAND AND CLARENCE DISTRICT—LIONSVILLE DIVISION.

(*James Fisher, Mining Registrar.*)

I HAVE the honor to report that there is little of an encouraging nature to mention. The long continued drought has prevented the alluvial miners from progressing satisfactorily, and the quartz mills from crushing even the limited amount of stone to grass. We have had, it is true, several fine thunder showers lately, sufficient to cause a fine growth in the grass; but quite inadequate to the requirements of the miners. There are now, and have been for the last ten months, over 120 tons of quartz, from Nos. 4 and 5 North Shellmaleer waiting to be crushed at the Reform Company's battery, but for want of water it cannot be treated.

There are but fourteen hands employed upon the quartz mines here, viz.:—

On the Lion Co.'s mine, 5 men 1 boy
On the Reform Co.'s mine, 4 men
On the Shellmaller, 2 men
On the 4th North Garibaldi, 2 men.

These numbers do not include the managers, of whom there are two—Mr. Fordred, who attends to both the Lion and Reform mines, and Mr. Winkley, who attends to the Shellmaler. No. 4 Garibaldi has no regularly appointed manager, being in the hands of two residents.

The Lion Co.'s men have been working and prospecting in different parts of the ground opened out without any success, and are now about to be set to sinking.

The Reform Company having driven a long level in very hard ground along the course of the reef, and also without result, I believe the mining manager has recommended the Board to sink also.

The Shellmaleer mine (proprietary) have been raising quartz from various parts of the mine, with slightly better prospects, and have now a large paddock in addition to the stone at the mill; but the manager is not sanguine as to large returns.

There are many vacant claims, some of which have been well opened, and upon many of which large sums of money have been expended, which might be prospected possibly with good results but for the hopelessness of getting any quartz crushed, and our diminished mining population is not in a position to wait long for returns.

In the Old Scrub (Mallern) the miners have not been able to do anything for want of water. There are three European miners there.

A lease of 16 acres has been applied for (and approved) by Mr. G. M. Larnach, which I believe will prove remunerative.

U

On the Bulldog there are four Europeans, and on the Ewingar three, all of whom have the same complaint to make.

On Sandy Creek a party of six Europeans have nearly completed a fine piece of work, having succeeded in cutting a tail-race through a long and deep granite bar. They are very sanguine as to their prospects, but without more rain they cannot realize anything.

On Grass-tree Creek, above Solferino township, one European has been working for more than two years in the same run of gold. He and the next mentioned miner are the only persons on the field who have a sufficient supply. He appears to be contented, but is reticent as to the amount of gold he gets.

A Chinese miner and gardener is working a piece of ground on the same creek, nearly a mile below the township. Besides the produce of his garden he says that he earns from 30s to 40s per week.

On Burnt-out Creek, an affluent of the south branch of the Clarence, a party of three men went out to prospect about four weeks since. They have not returned, nor have I heard from them.

Mr. Bassetti, now the only gold-buyer here, has purchased but 186 ozs. 3 dwts. 15 grs. during the year, and as far as I can learn about 20 ozs. remain in the hands of the miners.

The only gold won from the matrix has been 39 ozs., from 126 lbs. of quartz from the Reform Co.'s claim, which was treated in the Lion Co.'s berdan.

There has been no alteration in the number of stamps or other machinery this year.

No stamper has crushed anything.

NEW ENGLAND AND CLARENCE DISTRICT—BALLINA DIVISION.

(*Henry Bassman, Mining Registrar.*)

THE locality of the mining in this division is still confined to the sea-beach.

About 6 miles north and 23 miles south of the Richmond River Heads has been at different places worked upon during the year 1877. In the first three months of the year from six to eight men made about ½ oz. per week each. In the months of April, May, and June about twenty miners were at work, about the half of whom made from £3 to £5 per day, the rest not doing quite so well. For the last six months there have been from ten to twelve men at work; the result has been about the same as in the first three months of the year; it is only after a heavy storm, when the sea has washed away some of the terraces, that for some time good payable gold is obtained in patches.

NEW ENGLAND AND CLARENCE DISTRICT—WILSON'S DOWNFALL DIVISION.

(*William Hicks, Mining Registrar.*)

I SUBMIT the following report on the progress of tin-mining in my subdivision for the year 1877, and in doing so I beg to remark that, in consequence of my very recent appointment to the office of Mining Registrar, and not yet having received a map or tracings of my subdivision, I am not prepared to make as full a report as I would if I had held the appointment throughout the whole of the year 1877; also in consequence of the extreme dry season, the progress of mining in this district has been greatly impeded, and in some instances stopped altogether.

First, is the Wilson's Downfall claim, situated at Wilson's Downfall, the property of J. R. Smith & Co. This claim has been almost abandoned during 1877 for want of water, there being only an average of one man employed thereon, and the quantity of tin ore raised for the twelve months is about 2 tons.

The next claim at work is on Wylie Creek, which is a continuation of the Wilson's Downfall Creek, held by Ah Bow and party of five Chinese, who have raised 10 tons of tin ore in 1877.

The next claim on the creek is the Wheal Victoria, worked by Chow Sam and party of Chinese, averaging for the year twenty-eight men, who have raised 35 tons of tin ore during the year.

The next claim on this creek is the property of the Clifton Tin Mining Company, under the management of Mr. P. S. Dillon. The whole of this mine is let on tribute to parties of Chinese, and the average number of men employed during the year is 100, who have raised tin ore in that time amounting to 119 tons 2 cwt. and 4 lbs.

The next claim on this creek is in the St. Leonards Company's ground, under the management of Mr. Bruce, and worked by a party of fourteen men, who raised 35 tons of tin ore during the year.

The next claim on this creek is the property of Mr. Christian; but as there is no person in charge of it at present, I am unable to furnish a return.

Next to Wylie Creek, in a north-westerly direction, is Cemetery Creek, the first claim on which is the Peberdy, the property of Mr. Hugh Gunn. Several parties of Chinese tried this claim during the year, but in consequence of the scarcity of water they had to leave it with unsatisfactory results, the whole of the tin ore raised thereon for the year being only 3 tons.

Next claim lower down on the creek is the Great Dividing Range, the property of Messrs. Forster, Harriman, & Co., and under the management of Mr. Forster, with an average of forty men during the year, who raised 115 tons of tin ore.

The next on the same creek is the London claim, the property of Mr. Thos. Flannery, and worked by a party of thirty men under the management of Mr. Flannery. On this claim the water is preserved for repeated use by means of a centrifugal pump, worked by a 6-horse power engine, the water being carried back in fluming to the sluice-boxes. A return of 50 tons of ore was raised during the year.

The next claim on this creek is the Bondi West, the property of Messrs. Noble & Co., and under the management of Mr. H. Long, with an average of eighteen men, principally Chinese, for the year, and have raised 30 tons of tin ore.

The next claim on the same creek is the Bondi East, the property of Messrs. Mulherne and Norbury, and managed by themselves, with an average of twenty men during the year, who raised 54 tons of tin ore.

The next creek is Herding Yard Creek, about 2 miles north of Cemetery Creek. The top claim on this creek is held by Williams and party of three men, who have wash-dirt raised which they estimate will yield 10 tons of tin ore, but they cannot wash up until the wet season sets in.

The next claim on this creek is the Northern Boundary, the property of Messrs. Walsh and party of ten men. On this claim there is scarcely any water, and the party have wash-dirt raised they estimate will yield 50 tons of ore, besides 15 tons they have washed during the year.

The next claim on this creek is Amosfield, the property of A. and R. Amos, and under the management of Mr. Wm. Seaman. This is the principal claim in my subdivision, and has employed an average of seventy-five men during the year. The water on this claim is preserved for repeated use, and raised to fluming 21 feet high by means of a centrifugal pump, worked by an 8-horse power engine, and carried back 100 yards in fluming to the sluice-boxes; also, a 1-horse power California pump is used on another part of this mine for a similar purpose. The return of ore raised on this claim during 1877, including their claim on Cemetery Creek, is 500 tons.

Next claim at work on this creek is the Wheal Ethel, the property of Mr. Samuel Hare, who works it with an average of twelve men. Owing to the scarcity of water on this claim they have only washed 15 tons of ore during the year, but they have wash-dirt raised which they estimate will yield 10 tons more.

The next creek to Herding Yard is Ruby Creek, the top claim on whch is the property of the Silver Tin Mining Company, under the management of Mr. Westoven, of the Brisbane Company, Queensland, and worked by Foo Hung and party of twenty Chinese, who have raised 36 tons of tin ore during the year, together with wash dirt now on the ground which they estimate will yield 4 tons more.

The next claim at work on this creek is the Maryland Ruby, the property of Mr. T. Flannery, and worked by parties of Chinese; average number of men for the year, forty, who have raised 50 tons of tin ore during that time.

Lower down on this creek is Mr. Bruer's ground, worked by Ah Sin and party of thirty-five Chinese, and have raised ore amounting to 36 tons.

Next party at work on same creek is Neil Robertson and party of four men, on ground held under mineral license, and obtained 16 tons of tin ore during the year. Also a number of about 200 men, principally Chinese, situated on different creeks under mineral licenses, have raised about 200 tons during the year.

I may add that the average number of men employed on the mines in this division for the year 1877 is—Europeans, 160; Chinese, 470; but some parts of the year there were more, and parts less; and the total amount of tin ore raised in that time, as far as has been ascertained, is 1,395 tons 2 cwt. and 4 lbs., but more may have been raised in that time as several small holders have left the district whose returns cannot be accounted for. I wish to remark, that if a supply of water sufficient for mining purposes had been available during the year, the total amount of ore would have been increased by one-third.

REPORT OF INSPECTOR OF MINES.

(*W. H. J. Slee, Inspector of Mines.*)

I do myself the honor to forward to you a general report on the mining districts which I visited during the last twelve months.

Although special reports have been forwarded by me, extracts of which were published in the principal journals of this Colony, I nevertheless consider it my duty to lay before you in as brief a manner as possible compatible with the importance of our mining industry, such matters in connection thereto as in my opinion will prove beneficial to the Colony of New South Wales.

Since the Regulations for the Inspection of Mines other than Coal or Shale Mines were brought in force, I am glad to state that accidents have been of far less occurrence than in former years, even making due allowance for the decrease in number of our mining population; but my district being so large, extending over the whole Colony of New South Wales, and embracing all mines and minerals with the exception of coal and shale mines, I have been unable to visit all parts of the Colony, and so state authoritatively how many preventible accidents (whether fatal or otherwise) have taken place during the year 1877; but I hope to devise a plan during the year 1876, by which I will be able to issue in a tabular form, particulars of all accidents preventible or otherwise, taking place in all metallic mines all over the whole Colony of New South Wales. I can, however, confidently state, without fear of contradiction, that the above-named Regulations, issued in August, 1876, have already accomplished beneficial results in more than one way to the mining community of New South Wales.

At Hill End, Sofala, Bathurst, Hargraves, Mudgee, Gulgong, Wellington, Parkes, Forbes, Grenfell, Young, Gundagai, Adelong, Reedy Flat, Tumbarumba, and other places I visited, mine owners, managers, tributors, and others, are now well aware that they cannot with impunity risk the lives of persons employed in their mines, without being called to account for so doing, and rendering themselves liable to heavy damages.

Independently of verbal requests, several notices in writing (copies of which were duly forwarded to you) were served by me to mine owners, for the purpose of having such defects in their mines remedied as might otherwise cause injury to the life and health of persons employed therein, or to mining property.

The deplorable state of some mines in the districts I have visited often compelled me to strictly enforce the Regulations, but I am glad to inform you that although mine owners and others have often been put to extra expense by being compelled to keep their mine in a secure and workable state, they have nevertheless acknowledged the justice and necessity of bringing these Regulations for the Inspection of Metallic Mines in force; in proof of which I might state, that during the whole year of 1877, only one party has been fined for the non-compliance with said Regulations.

Dynamite.

This powerful explosive has during the last twelve months been brought prominently before the public by a Mr. M'Neil, Agent from Scotland for Nobel's Dynamite. In my last Annual Report, I mentioned that dynamite had been extensively used by a Mr. Gitchell, in the Tumbarumba District, in his extensive sluicing operations, although it had not been brought in frequent use for deep mining in this Colony. I therefore considered it my duty (on the arrival of Mr. M'Neil on Hill End, whom I also afterwards met on Adelong and Snow-ball Copper Mine, near Gundagai) in the interests of the mining industry, and the health of our working miners, to watch closely the introduction of this almost unknown powerful explosive. Accordingly, I was present in the underground workings when shots or blasts charged with dynamite were fired. Complaints are often made that the fumes of dynamite affect the head, which certainly is the case at times, but this headache seldom lasts longer than for a few days, after which the human system seems to get used to the dynamite, and the headache disappears. Miners should be careful not to use any metallic substance for tamping the hole, and in no case should they prick the cap; they should also as little as possible handle the loose dynamite or the rock shot out; by using this precaution they would not come in contact with the nitro-glycerine, one of the ingredients of dynamite, and which is the cause of the headache.

The miners as a class have great prejudices against dynamite, or against any new explosive which is invented for the purpose of superseding blasting powder. On Carroll & Beard's Mine, Hill End, also on the Star of Peace, dynamite was introduced with success.

I advised Mr. H. Marshall, the manager of the Carroll & Beard G.M.C. to allow his men the use of either blasting powder or dynamite whichever they chose; at the same time I gave the manager and working men distinctly to understand that should dynamite injure their health, I would condemn the same and not allow it to be used in any mine on Hill End—provided that it received a fair and impartial trial. Little by little the men cast away the black jack (blasting powder) and used the dynamite; even four men employed in a jump-up or rise on the 500 feet level, where the fumes or smoke would hang longer than any other place, tried the dynamite and are now great converts for this explosive. I was present when several shots were fired in this rise, but felt no effects from the fumes, although I entered as soon as possible and before the fumes could disappear; had I felt any bad effect, I should have considered whatwas injurious to me would also be so to working miners, and should have taken necessary proceedings accordingly. In wet weather and hard ground dynamite is without exception the most powerful and effective explosive known; it requires no tamping only water or sand, and if handled carefully it is no more dangerous than blasting powder, as long as there is good ventilation in the mine. I have gone into details on this matter, because I believe that nothing will be gained by lowering wages, as that means lowering the standard and quality of our working miners. Cheap labour means inferior men. Every conceivable and justifiable inducement should be given to any invention having for its object the more expeditious and less expensive working of our mines, for which object I shall at all times consider it my duty to lend a helping hand, and most heartily co-operate.

Prospecting.

Mining throughout New South Wales although slightly recovering is nevertheless dull, not because our auriferous and mineral lands are exhausted or even developed, but because it is retarded through the long protracted drought following so closely upon the late mining mania. In many districts sluicing operations have been entirely suspended, no water being available for such purposes for at least the last two years; and the almost total absence of prospecting in new country, or near old workings, must be attributed to the above-named cause. However willing prospectors might be to spend months of hard toil, and go through all sorts of privation, they cannot go into the wild bush or forest without horses to move their camps, provisions, tools, &c.; they therefore require grass and water, which certainly have been very rare commodities of late in many districts of New South Wales. The Australian gold miner, as a rule, is not easily discouraged, and there is perhaps no other class of men who will carry on their vocations with such tenacity, facing the greatest danger and privation, and making light of almost insurmountable difficulty in their way, as the Australian gold miner will do. I might safely predict that our gold-fields will take a turn for the better ere long, or at any rate as soon as the first favourable season brings us abundance of grass and water, as thousands of acres of auriferous country have never seen the pick of the miner and therefore will be looked after by the prospector.

While on this subject I beg most respectfully to draw your attention to a matter which if judiciously managed in detail might greatly assist the gold miner and be of immense benefit to the Colony of New South Wales, I allude to a sum of money being placed on the Estimates for the purpose of searching for payable gold workings. I am well aware that a system of Government prospecting is surrounded with many and great difficulties, and that although the Colony of Victoria has expended large sums of money for the said purposes, very few gold-fields have been opened by Government prospectors; but we must also consider and bear in mind that the auriferous country in the Colony of Victoria is compact and limited, whereas we have miles upon miles of auriferous country scattered over the immense territory of New South Wales. I would most respectfully suggest that instead of the Government of New South Wales sending out prospecting parties solely supported by public money, a system of subsidising should be introduced, that is to say, that if any party of miners or body of persons, whether living in a town or country district, deposit a sum of money (say not less than £20) in a Bank for the sole purpose of prospecting for gold, the Government should supplement the same pound for pound. Stringent regulations could be framed for the guidance of all parties concerned, and for the due protection of the public purse. Parties should be left free to prospect wherever they choose in the Colony of New South Wales, but they should be compelled to give account of their expenditure and operations to an officer of the Department of Mines, such as a Gold Field Warden or Inspector of Mines. This system would do away with undue influence in appointing unworthy persons for the tedious and laborious work of prospecting. It would create more self-reliance and independence; it would induce parties of miners with small capital to prospect, and townspeople and others to subscribe. By a system of helping themselves they would be helped. Every town in the neighbourhood of auriferous country would for a time at least have its prospecting parties selected by ballot, or otherwise by the subscribers to the Prospecting Fund.

I think, by these means our gold mining industry would be raised from its present lethargy and false position, into which it has fallen through the long protracted drought, the consequent impoverished state of our gold miner, and the late memorable mining mania.

The Alienation of Crown Lands on Gold Fields.

I am sorry to say that the power given by the 2nd clause of the "Crown Lands Alienation Act of 1875" has been greatly abused, as can be seen on many of our principal gold-fields. The clause no doubt was intended, and very properly so, for the benefit of allowing miners to settle with their families on a 2-acre block of land within the boundaries of a gold-field; but instead of which, unauthorized persons, without a miner's right or business license, have enclosed by fences large areas of auriferous country in the very heart of our gold-fields, either for the purpose of speculation, grass paddocks, or cultivation, whereby the *bonâ fide* miner is driven from his legitimate occupation, because all the ground worth prospecting is enclosed by these unauthorized persons, who by their unlawful occupation of Crown Lands, not only defraud the revenue of the Department of Mines, but also create a permanent obstacle and barrier to the future development of our gold-fields. On Adelong, where payable quartz reefs at the depth of 700 and 800 feet are now at work, well-known lines of auriferous reefs and tracts of country have been fenced in and held for years without payment of one farthing to the Government for the use of said lands, at the same time preventing the *bonâ fide* miner from entering for gold-mining purposes. Several cases of this kind were brought under my notice during my stay on Adelong, and in several instances I took such steps as I thought best, by which means several miners entered these for years unlawfully locked-up auriferous lands, obtained payable gold therefrom, and not only benefited themselves and their families but also the whole district.

On Grenfell, the whole lines of auriferous quartz reefs are now nearly fenced in. Although this might raise a fictitious prosperity for a year or two, by employing persons to fence in these lands, it is only to the miner like making a whip wherewith to receive his own flogging; because when all the fences are completed, he will then be compelled to look for work elsewhere, as by his own apathy and carelessness he allowed all the auriferous country worth prospecting to be fenced in. Very little if any objection could be had for persons to take up non-auriferous land on a gold-field, but why all the well-known lines of quartz reefs and auriferous alluvial country on a gold-field should be fenced in by those craving for possession of land might to some appear a mystery, but after due consideration no other conclusion can be arrived at than that said lands are taken up for speculative purposes.

Cancellation of Gold Mining Leases.

Areas of auriferous country (cancelled leases) have lately been taken either by application for lease or by virtue of miner's right, but miners and others on the gold-fields object to take the trouble and expense of having a lease cancelled on the non-compliance of the labour condition, because the informant is not considered the first applicant. I would respectfully suggest to take into your favourable consideration the expediency or otherwise of issuing a regulation to give the informant the prior right, and so consider him the first applicant; by these means many now locked-up gold-mining leases would again prove payable and employ many miners.

Our Mining Districts.

Commencing with Hill End (my head quarters), properly called the Tambaroora and Hill End District, I am unable to give a very glowing account concerning the present yield of gold. Hill End and Tambaroora is solely a mining district, having very little agricultural or pastoral lands within its neighbourhood; the consequence is that property of all descriptions, business, and other matters, fluctuate according to the rise and fall in the yield of gold. This is plainly observable throughout the district. Although I fully believe and sincerely trust that Hill End will never see such mining excitement again as we saw here a few years ago, still I think mining on Hill End and Tambaroora might again recover, and be worked on a more sound, beneficial, and legitimate footing. Thousands of pounds sterling have been squandered on these gold-fields, many bubble companies have been carried on, if only for a time, to enable unscrupulous persons to enrich themselves at the cost of a but too confiding public. This, I am happy to say, is now a thing of the past; although it has left its fatal consequence behind, and now requires all our energy, tact, and perseverance to show to the world that although a whole community was carried away in a state of excitement by the enormous yield of gold of the Hill End Mines—although part of that community failed in realizing according to expectation—that the Hill End Gold Mines are nevertheless worthy of the support of the *bonâ fide* capitalist and prospector, and that gold mining on Hill End and the whole Colony of New South Wales is not such reckless venture, provided proper precautions are taken not only in the selection of the mines but also in manager and miners.

Hill End can still boast of several good payable mines, but most of the former rich claims are only fossicking. Through want of foresight, the whole of the mines from the Star of Peace to Rapp's are cut off on their eastern boundary by the Star of Peace Company; the consequence is, that none of these mines south of the Star of Peace, including Rapp's, can sink to any great depth (say over 700 feet), as by so doing they would only prospect for the Star of Peace, the underlay of the veins being about 1 foot 9 inches per fathom towards the east. For this reason the Star of Peace must be in future considered as the principal mine on Hawkin's Hill. They are now down about 750 feet and still sinking with a probability of success. Lately they struck some payable gold in their top levels, which it is considered will pay all expenses connected with their mine including the sinking of their deep shaft.

As already stated in former communications to you, my hopes are centered in the Star of Peace and Carroll & Beard Mines; although the latter has stopped sinking at a depth of 720 feet, they are cross-cutting to the west, and therefore have the opportunity of discovering new payable veins in that direction, which would give new life into all the mines between this and the Star of Peace.

The former however is carrying on mining on a more extensive scale than any other mine in the whole district. Every justifiable encouragement should be given to such companies; because, should they strike payable gold in their deepest levels, a new era of gold-mining would be initiated throughout the Western Districts, which would be of immense benefit not only to Hill End but to the whole of New South Wales.

I look on such mines as the Star of Peace on Hill End, the Great Victoria, Adelong, and the Grenfell Consols on Grenfell, as partaking more of the character of national questions than that of private enterprises.

I should very much like to have seen the Star of Peace shaft more to the south, or else the levels opened towards the south, because I believe that the present deep shaft of the Star of Peace has been on a poor part of the lode from the surface down, and that probably their best gold will be found south and some north of their deep shaft. Gold in our quartz veins generally runs in shoots often perpendicular, at other times horizontal or in a slanting position, therefore a perpendicular shaft might be sunk alongside of a rich shoot of gold. Cross-cutting should be adhered to.

The Lady Belmore on the south, which during December crushed out of 19 tons of quartz 207 ozs. of retorted gold, and the Cornishman's, Frenchmen's, and others north of Hawkin's Hill, had some good payable crushings of late, which has given quite an impetus in mining here.

On Sofala large and expensive operations for hydraulic sluicing are now in course of preparation.

Hargraves has suffered greatly through the drought, and mining is stagnated in consequence.

In the Mudgee and Gulgong Districts nearly the whole of the mining carried on is in alluvial; although quartz reefs abound, they are very little looked after in this district.

On Gulgong, where the alluvial leads have been enormously rich, the escorts having taken from this gold-field no less than 16 tons of gold in (7) seven years, very little capital has been expended to develop the resources of the district by thoroughly prospecting the deep leads. I am confident that if capital was judiciously invested for the purpose of testing the lower parts of the Black, Happy Valley, and other leads, it would raise Gulgong from its present dull and stagnant state into a prosperous mining town and entitle her to be considered the Ballarat of New South Wales. By close observation I believe the true course of the Black Lead will be found west of the shafts sunk below the No. 23 Claim.

Enterprising capitalists would do well to give this place a visit and judge for themselves.

The quartz reefs, which have been greatly neglected, should also be more looked after.

Mitchell's Creek, near Wellington.

The Kaiser's and Mitchell's Creek Company are at work with fair success.

The whole country between Mitchell's Creek and Gulgong, a distance of about 40 miles, has the appearance of being highly auriferous. (When I travelled through these parts there was hardly a blade of grass or any water to be seen.) Prospecting parties would find this part of New South Wales well worthy their attention. The hills are strewn with quartz, and gold specimens have been picked up on the surface.

Parkes District.

This district has severely suffered through the late protracted drought. It is rich in gold and minerals and will for a long time to come be the centre of a large mining population. The quartz reefs should be more looked after here, as they are worthy the attention of the miner.

Forbes.

Although mining is dull at present, I think, with capital judiciously invested, that the Old South Lead might be worked with profitable results.

Emu Creek and Tyagong Gold Fields.

These gold-fields have suffered greatly through the severe drought, and mining might almost be considered at a stand-still. But on Grenfell alone there are no less than twenty-four well-defined payable quartz reefs, some have crushed as high as 7 ozs. per ton with a thickness of reef from 1 to 10 feet, and still with the exception of one shaft on the O'Brien's Reef (Grenfell Consols) not one of these reefs have been sunk on to a depth of 400 feet. When we consider that some of the shareholders in these reefs realized in two or three years from £5,000 to over £20,000 sterling free of all expenses, one would have thought that more spirit of enterprise would have been shown even by the Grenfell townspeople themselves to try and develop their mines. No person could or would venture to say that a rich shoot of gold which gave thousands of ozs. of gold from the surface down to about 300 feet would altogether disappear. Such belief would be against practical knowledge and scientific researches. Victoria, California, and even Adelong in New South Wales, furnish us with records that quartz reefs are paying at a great or even an unlimited depth. During the last few years a sort of land mania seems to have got hold of the Grenfell people, the consequence is that the mining industry is entirely discouraged and nearly crushed. The reefs or lines of reefs are all fenced in, and the alluvial flats free-selected. In the face of all this, the miner, geological surveyor, and anyone knowing the district and having any knowledge of gold-mining, firmly believe that large deposits of gold will still be found not only in the Grenfell reefs but also in the vicinity of the Tyagong. The Tyagong reefs have also proved auriferous, and every lead on Grenfell—the Main Lead, Two Mile, Quandong, and Seven Mile included—empty themselves towards the Tyagong Creek and point to the great probability that large auriferous deposits will be met with in this neighbourhood.

The alluvial being generally over 100 feet deep, the boring rod should be brought into more frequent use. The townspeople should also for their own interest bestir themselves and prevent the fencing in of the lines of reefs; the present fictitious prosperity caused by men being employed in fencing in their auriferous country must soon come to an end, or else they will find out when too late, that by their own doings they have driven the miner from the place and prevented the capitalist from investing, as there will be no room left for machinery sites and mining operations on a large scale. The greatest benefit for any district is the encouragement of as many industries as possible, but to fence in a whole gold-field in blocks from 4 to perhaps 100 acres mostly for speculative purposes is a narrow minded policy, and detrimental to the future prosperity of any district.

If proper means were taken by the inhabitants, Grenfell might flourish and have a large mining, agricultural, and pastoral population, whereas now by the total discouragement of mining and the loss to the free selector of a market for his produce, there is little hope of Grenfell rising to a place of such importance as the gold, mineral, and agricultural resources entitle her to occupy. I believe there are galena lodes near Grenfell.

If the country between Grenfell and Forbes was thoroughly prospected it would probably end in beneficial results, not only to Grenfell and Forbes but to the whole Colony. Miners and others acquainted with this district have long expressed an opinion that an extensive gold-field, both alluvial and quartz, will yet be found between Grenfell and Forbes.

Burrangong Gold Field (*Young*).

This once famous gold-field, better known as Lambing Flat, is as far as its gold producing power is concerned almost *nil;* although this is the case at present, a great deal of the inactivity in the mining industry must be attributed to the long protracted drought. The miners on this gold-field have constructed at great labour and expense long races for the purpose of sluicing the old auriferous ground. For years numbers of miners have made good wages and supported their families respectably, but for the last two years these races have been dry or running for but a very short time. The consequence is, that these men who were before the drought profitably employed in sluicing operations, had for the time being to embrace other occupations. I expect after the first wet season numbers of miners will again be profitably employed in sluicing operations. Tonkings Bros. have also been engaged for the last two years in bringing up a covered tail-race for the purpose of draining Opossum Flat. Should they succeed and be able to work this only partially worked, rich, but water-soaked flat, they will add greatly to the prosperity of this already important town of Young.

There are also several quartz veins on this gold-field worthy the attention of practical miners. I might mention the Hidden Treasure near Specimen Gully. I personally crushed out of 4 lbs. of quartz, 1 oz. 5 dwts. of gold, and crushings of several tons each treated by defective gold-saving appliances have never yielded less than 8 dwts. per ton. Rich but small patches are often met with, the greatest depth is only 50 feet, thickness of vein 1 foot. This vein ought to pay well to a party of practical miners who possess capital to erect a small compact and good crushing machine near the reef, where a good water-shed can obtained.

The Gundagai District.

In this district there are several quartz reefs, also alluvial workings; in the same I might mention Pyke and Champion, Bushman's Daughter, Kangaroo, and other reefs. The alluvial is almost at a stand-still. I think Pyke and Champion's, which I visited, might prove a good investment for a small capital. At present the quartz has to be crushed in Adelong, a distance of about 25 miles, this with crushing and carting takes nearly 1 oz. of gold per ton. I saw some very good specimens on this reef, and the last quartz crushed on Adelong in October last yielded over 2 ozs. per ton, with a thickness of reef of about 1½ foot, and the gold irregularly distributed.

On the Kangaroo Reef a 10-stamp battery was in course of erection. The company expected to start crushing in the beginning of 1878. The shareholders, Victorian Capitalists, are sanguine of success.

Gundagai is also surrounded by a large area of cupriferous country, from Jones's Creek on the north, to the Mingary Mountains on the south, and is therefore destined to become the market town for a large mining population, especially should a railway be constructed from the nearest point of the Southern Line to Gundagai.

The principal mine at present at work in this district is the Snow-ball Copper Mine, about 8 miles south of Gundagai. There are several shafts on this mine, the deepest being about 130 feet with a 10 feet wide slaty lode and solid blocks of yellow sulphides intermixed (Large blocks of ore in all about 1½ ton were kindly given to me by the proprietors and forwarded through the Department of Mines to the Paris Exhibition.) There are two furnaces in full work and the third in erection. The population about this mine must be about 150. With judicious management this mine should prove payable.

Near the Mingary mountains, about 3 miles south-east of the Snow-ball, strong stains of copper with green and blue carbonates, and occasionally pieces of gray and yellow ore can be distinctly traced for a long distance. There is an 80-acre mineral lease held by a Mr. Sturt of Snow-ball which is well worth a trial, as very little work has been done on said lease. Galena can also be found in this neighbourhood.

Adelong Gold Field.

Which can lay claim as one of the oldest and most permanent quartz reefing districts in New South Wales, also as having some of the best quartz crushing machines in the Colony, has already been fully reported on by me in my last annual report. Since that report was written, the Great Victoria Gold Mining Company, Mr. D. Walker, Manager, have received the Government reward of £1,000 for having obtained payable gold at the perpendicular depth of 820 feet. This company have lately erected a 12-horse power winding engine, and have substituted cages for buckets. Every thing looks well and has the look of permanency.

Annett's, a private company is now over 700 feet deep with a thickness of a reef 3 feet. During two month's work the company realized out of 640 tons quartz, 804 ozs. 17 dwts. retorted gold. The Extended Victoria, Mr. Wallis, Manager: Payable crushing has been obtained lately, and everything connected with this mine put in good order, although this mine has been lying idle as worthless for several years past. The United Adelong has lately made extensive improvements; they are now winding with their machinery from both their north and south shafts; the distance between the shafts is fully 600 yards, everything works well and satisfactorily. This is a large and valuable property. The Challenger, a local company, has also erected a 10-horse power winding engine. This mine has every probability of success.

Allowing for the effects of the drought, which has greatly interfered with sluicing operations. The yield of the Adelong Gold Field has not decreased this year; and taking all matters into consideration, I fully believe improvements will take place in a few months time. Nothing has shaken my faith in the permanency of the district as a gold-field.

Reedy Flat and Upper Adelong.

This gold-field still employs a few miners in sluicing claims, but water has of late been rather scarce. The population have combined agriculture with mining. The water races which have not sufficent water during the summer months are utilized for irrigation purposes, by which means large crops of potatoes, &c., are produced.

Tumbarumba Gold Field.

On which I also fully reported in my last annual report, has not had sufficient rainfall to enable Mr. Gitchell and others to carry on their extensive sluicing operations. I believe it is the intention of Mr. Gitchell, in co-operation with other capitalists, to expend a large amount of capital for the purpose of cutting a tail-race and sluicing the whole of that part of Tumbarumba Creek which is leased by Messrs. Kingscote & Co., and which is considered will be a payable speculation.

In the Kiandra District there are miles upon miles of auriferous country which have never seen the pick of the miner. On the Nine-mile, Kiandra, an attempt was lately made by a few gentlemen, including a well-known mining manager, Mr. Phillip Davies, to try and bring the water from the head of the Tumut River, in which attempt they failed. Could water for extensive sluicing operations be brought to bear on the Kiandra Gold Field, the benefits accruing therefrom would be extraordinary for New South Wales. The whole country between Kiandra, Tumbarumba, Tumut, and Queanbeyan, has never received due attention by the gold prospector.

Here are immense flats bearing on the face of them every indication of being auriferous. Most of the prospectors who visited these parts are known by the miner as gully-rakers, that is, they only try and prospect near the surface in shallow gullies or sides of hills, but seldom attempt to sink in those deep alluvial flats which abound in among these Australian Alps.

That rich and alluvial leads exist amongst these Snowy Mountains there is but little doubt, but there are also some difficulties connected with prospecting the same:—1. The snow would interfere during the winter months. 2. Provisions, &c., would have to be brought by pack-horses. 3. Prospectors would have either to bring a boring machine or bring tools and appliances to contend against water and 200 or perhaps 300 feet sinking. For instance, some years ago (I write from personal knowledge) some patches of gold were found on places called Brammanero and Brindabella. The latter is about 25 miles from Kiandra, on the Bridle Track Road to Yass, and is situated on the Brindabella River. Great expectations were formed of the last-named place. One party of four miners obtained some 50 ozs. of gold, amongst which were pieces fully (5 dwts.) five pennyweights. This gold was obtained near the surface in a blind gully or sidling of a hill. Another party of four men started to sink within less than 100 yards from where the gold on the surface was obtained, when to their astonishment they sunk over 100 feet deep without being bottomed. The water coming in on them, their strength and appliances being such as would not enable them to overcome the water, they were obliged to leave. There are some three or four shafts sunk, but not one bottomed.

Here are all the indications the Australian gold miner is in search of when on a prospecting tour. The country is of diorite, granite, slate, limestone, and sandstone formation. Ironstone veins can be seen, and large quartz and ironstone boulders and pebbles can be traced through country which miners would call made ground.

I have not seen any part of New South Wales which in my opinion better deserves the attention of the gold prospector than these alluvial flats amongst the Snowy Mountains.

In conclusion, I beg to express a strong belief that by force of circumstances New South Wales must ere long make onward strides in her mining industry.

If our quartz reefs were sunk through their barren parts, and systematical mining and prospecting carried on over the large auriferous areas of this Colony, we would soon overcome the injurious effects of the late drought and mining mania.

Minerals of all description are scattered east, north, south, and west over the vast territory of New South Wales, and only those acquainted with the interior of this Colony can form a slight opinion of the powerful part New South Wales sooner or later will play in the markets of the world as a gold and mineral producing country.

SINCE my letter of yesterday I have again visited the underground workings of the Star of Peace.

The gold is still visible in payable and even rich quantities. At present only about 6 feet square has been opened in the cross-cut, and out of this about 500 lbs. quartz specimens which I estimate as containing about 500 ozs. of gold, and about 12 tons of seconds which I think will crush about 5 ozs. per ton, were taken within the last four days.

Another vein about 1 foot east of the rich shoot or patch was cut yesterday, showing payable gold. there are also gold-bearing quartz leaders still in sight.

In expressing my wish to Mr. Fairfax, one of the Sydney directors of the Star of Peace, that I should like to get some of these magnificent specimens forwarded to the Paris Exhibition, or exhibited in the Museum of the Department of Mines, Mr. Fairfax informed me that the whole of these specimens would be taken to Sydney, and every facility would be given to the Government to have at least some of these specimens sent to the Paris Exhibition.

I am confident if arrangements could be made with the directors of the Star of Peace for some or all of these specimens after their arrival in Sydney, New South Wales would figure before the world as not only showing the richest minerals, but also the richest gold specimens of the Australian Colonies, if not the whole world.

THE Star of Peace Gold Mining Company has lately changed their mining management. Mr. John Marten, late of Sandhurst, Victoria, is the general manager, and Mr. T. Mustacka, late manager of Paxton's Gold Mining Company, is the mining manager.

The latter gentleman has long been of opinion that the former rich veins worked in Paxton's Gold Mining Company, but never traced into the Star of Peace mine, could be found. Cross-cuts to intersect these veins had already been put in at different levels by former managers. The mining manager, however, set men to work to cross-cut towards east near Paxton's boundary, and in a few days' work discovered a rich patch of gold at the 160-feet level and about 12 feet east of Paxton's vein. About 200 lbs. of quartz specimens were taken from this vein and placed for better security in the Joint Stock Bank, which I estimate to contain about 100 ozs. of gold. Some of these specimens are really magnificent, and if a few could be obtained for the Paris Exhibition would without doubt attract immense attention.

The vein where first cut is about 2 feet wide, showing rich gold; but this might be only a bulge-out or small blow, and the vein in other parts is certain to be smaller. It will also require time to prove whether this is only a patch or the continuation of the shoot or run of gold worked in the mines south of the Star of Peace.

I also consider it my duty to inform you that even should this discovery prove more than a patch, which I trust it will, there is very little hope that any of the mines from Paxton's to Carroll and Beard's will strike the shoot or run of gold, for the simple reason that the above-named mines have already worked said run of gold. There is, however, a probability that the mines north of the Star of Peace might strike the same run of gold.

I again beg to reiterate, even at the risk of being a bore, statements I made in my Annual Report of 1876 and other reports, that where there are parallel running veins, gold is often found—first in one then in another vein (to use a miner's phrase, jumping from one to another)—leaving barren and gold-bearing parts alternately; therefore, no mine should be condemned as worthless, or worked out, until all the parallel running veins are thoroughly tested by cross-cuts and otherwise.

We have many instances in New South Wales where mines were condemned as worthless, when by a little careful observation and perseverance said mines have proved profitable investments.

I have no doubt that the top levels of the Star of Peace Gold Mining Company's mine were by many miners and others condemned as worthless and considered well tried; still for all this there is now good reason to believe that even should the new discovery be only a patch, that there will be gold enough extracted from the top levels of the Star of Peace to pay more than expenses for some time to come in connection with the whole workings of this extensive mine.

I HAVE visited and inspected Canowindra District. Mining matters are dull here; but the country in both northerly as well as in a southerly direction, especially between here and Wood's Flat, a distance of about 20 miles, has the appearance of being more or less and in some places highly auriferous; it certainly deserves to be more thoroughly prospected by the gold miner. I have no doubt that payable patches or leads of gold would be met with; the formation is diorite associated with granite and belts of schists.

I saw during my short stay here two parcels of coarse gold, one weighing 3 ozs. 12 dwts., obtained by three men from the head of Jack's Creek, the other weighing 8 ozs. 7 dwts. obtained by a party of miners at Wood's Flat. Very rich specimens of gold have also been obtained at both places. From the head of Jack's Creek one specimen, weighing about 18 ozs., when crushed realized £28 10s.; and I saw a specimen obtained from the same place, weighing about 6 ozs., and which I believe contains about 1½ oz. of gold.

Although several reefs have been found about this creek, all containing more or less gold, they have not been systematically worked, but only scratched over. Indications at this creek point to a great probability of a rich reef being discovered sooner or later in its neighbourhood.

The principal mining operations are about 1½ mile east of the township of Canowindra, and are situated on a hill known as the Belmore. On this hill several quartz veins can be distinctly traced along the surface; some three or four have been proved payable, especially the Hayes's and Belmore or Blue Jacket Reefs. The Belmore or Blue Jacket Reef has been worked for about 200 yards in length, and from 2,000 to 3,000 tons of quartz, averaging about 12 dwts. per ton, obtained therefrom. The course of reef is nearly east and west, with a northerly underlay of about 3 feet in 10 feet. The reef, although often bulging out from 1 to 4 feet, only carries gold in one wall seldom wider than 18 inches. The deepest part of this reef is about 250 feet; at or near this level the vein greatly changes its underlay, and instead of underlaying 3 feet in 10 feet it runs almost horizontal; however, the original shareholders only followed the vein for about 15 feet on the horizontal, when they gave up the search. There is now about 40 to 50 feet of water in these workings, and the whole reef is lying idle.

There are three parallel running veins which although all named the Belmore or Blue Jacket are nevertheless distinct from each other; and, therefore, there is a probability that, although the shoot, run, or lead of gold has to all appearances been lost or worked out in one vein, it might again be found in a parallel running vein.

I am of opinion that there is no payable gold in sight on the stopes in any part of this reef; and, therefore, sinking and cross cutting must be carried on by any company having for its object the development of this mine. A perpendicular shaft, say from 300 to 400 ft. deep, should be sunk north but near the Blue Jacket Prospecting Claim, and cross-cuts should be driven through all the parallel running veins. If this is done, there is a chance of profitable returns for capital invested; but this requires at least £1,500, the country being hard (diorite and granite) and therefore expensive to work.

To preserve these reefs from being free selected, I would most respectfully but strongly urge upon the Honorable the Minister for Mines to cause these quartz reefs to be reserved from conditional purchase or auction sale, and kept open for mining purposes, by proclaiming a reserve of 1 mile square, taking as near as possible for its centre the Belmore or Blue Jacket prospecting claim, and including the whole of Hayes's and Belmore Reefs. This would not interfere with the settlement of this district; but it would benefit the district, as well as the revenue of the country. If this is not done, there is no doubt that these auriferous reefs will fall into the hands of a free selector perhaps for speculative purposes. The hill being very rocky, it is unfit for cultivation, and the Government would derive more revenue from gold mining leases.

Sooner or later these reefs will again be worked if not by capitalists by miners who are willing to work on their own account below the current rate of wages in the hopes of getting something better.

I HAVE visited the Cargo Gold Field and inspected some of the underground workings.

The Cargo Gold Field seems to have been neglected, as there are numerous quartz or pyrites veins and extensive gullies and flats, which ought to be more thoroughly prospected. Cross-cuts or tunnels should also be put through some of the hills so as to test the auriferous quality of parallel running veins.

There is very little doubt in my mind but that the principal feeder of the payable auriferous deposits on the Cargo Gold Field has been the Ironclad Range.

This range has an elevation of about 600 feet and runs about S.S.E. by N.N.W. It has on its eastern slope near the crown of the hill the rich and famous Ironclad Reef.

The principal alluvial in actual work on this gold-field is on Gum Flat, an extensive valley on the western slope of the Ironclad Range. During my visit I found about thirty men at work. Here several auriferous strata have been worked with payable results, in some places the miners have worked two different strata or false bottoms, the first at a depth of 50 feet, the second immediately underneath at about 100 feet, both proving payable; there are also a few miners who after working the horizontal auriferous strata are following down a lode with a western underlay. One party have followed this lode to a depth of 300 feet, still giving them wages for working the same. This lode I believe to be a fissure commonly found in the limestone formations and filled up with auriferous strata, in fact the workings on Gum Flat might be classed with the workings on the Canadian Lead, Gulgong, to which they bear a great resemblance. Gum Flat, however, deserves to be thoroughly prospected, especially the northern end. Shafts over the depth of 200 feet have been sunk, but none bottomed, although one shaft sunk by a party of miners after passing through several layers of clay and auriferous drifts came into a white wash and sandy drift; another obtained fossil bones, leaves, and wood. They nevertheless in the face of these excellent indications never bottomed, for the simple reason that their shafts were too small (more fit to sink 30 than 300 feet), and they considered it dangerous to go any deeper. Shafts on this flat especially for prospecting should be slabbed and centred, although there is no water at the greatest depth as yet obtained. Water might make its appearance near the bottom.

This flat runs due north and south for many miles, and receives several tributaries some of which contain payable gold. The whole extent of the workings is not 1 mile in length; the sinking is comparatively easy, therefore the inhabitants of Cargo should unite, and by a co-operative system of capital and labour develope the undoubtedly great mineral resources of their district, and thereby make Cargo what it ought to be—a flourishing mining and agricultural town.

The Ironclad Company's property consists of a 6-acre gold mining lease, greatest depth about 350 feet, but stoping has only been carried on to about the 300 feet level. All work is suspended with the exception of the 70 feet level, from which the company are now crushing. The vein varies in thickness from 1 inch upwards, their present crushing stuff is about 6 feet in width. The blue veins are strongly impregnated with pyrites, there are also strong stains of copper and red oxide of iron; gold can often be seen in the pyrites with the naked eye, but generally the gold is very fine and coated by pyrites.

I think other veins would be met with running parallel and perhaps in close proximity with the Ironclad vein. My reason for thinking so is, that the western or foot-wall vein has a very broken appearance, and therefore the real foot-wall of the vein or probable belt of veins has not been reached.

I would very strongly recommend the Ironclad Company to put a cross-cut through the hill from their whim shaft; they could start from their 70 feet level, where the country would not be very expensive to work.

The machinery consists of 25-horse power engine, 15 stamp battery, 3 Wheeler's pans and concentrator, and a Munday buddle.

There is however a fault about the erection of this machinery :—

1. The whole machinery has been sunk too low, and the Wheeler's pans and concentrator are placed in front, direct between the battery and buddle, allowing for no tables. Everything therefore is blocked and crammed up. Should the company intend to work their battery for a length of time, I should certainly advise them to erect their Wheeler's pans and concentrator on the end of their battery, and to lay tables where the pans now stand. I think in their case canvas must be more beneficial than blankets.

2. The company should with as little delay as possible discontinue using the same water for their boiler as they are now using for crushing purposes.

The crushing stuff is strongly impregnated with copper, and the chemicals used in the Wheeler's pans for amalgamating purposes, such as sal ammonia, caustic soda, &c., pass with the water into the dam, and from there again into the boiler, and as there is only a limited supply of water the same is used over and over again.

These chemical salts have the effect of causing a large percentage of copper to dissolve, which when in solution enters the boiler with the water, where it precipitates and eats into and decomposes the boiler plates; the consequence will be, that not only the boiler will be injuriously effected, but it might cause a greater calamity, either of which might be avoided by using water for the boiler from a dam already constructed, immediately above the dam from which they obtain their water for crushing purposes. This could be done by pipes, the cost would be small in comparison with the risk they run both to the safety of their property and human life.

I HAVE inspected the Ironbarks, Stoney Creek, and Muckerawa Gold Fields.

Although every gully or flat has been auriferous, very little work is at present carried on in alluvial, but the produce of gold from quartz veins is rather on an increase. I found miners at work on several of the following auriferous reefs :—The Post Office, Poor Man's, Trickett's, German Jack's, Old Ginger, Beehive, United Miners, Perseverance, Muckerawa, and Specimen Hill. None of these reefs have been worked to a depth of 200 feet. The Post Office and Poor Man's Reefs have well-defined walls and would be the best veins on which to make a trial for deep sinking. No doubt, by present appearance, the gold has run out, still scientific researches and practical knowledge have proved that in California, Victoria, and even in New South Wales, barren layers of quartz are met with in the richest mines. In some instances these layers of barren quartz have reached the thickness of 200 to 300 feet, as has been the case in Annett's mine, on Adelong, N.S.W; but the enterprising searcher might come on a payable shoot of gold in less distance.

The whole of this gold-field is one network of quartz-veins, therefore it presents to the persevering and enterprising prospector a field on which there is a likelihood of getting amply rewarded. So far the payable gold obtained in the quartz-veins in this district has been found in shoots or patches. The former generally appear on the surface in the shape of a pinnacle, often only a few feet in length, but widening out as they descend. They are therefore easily missed on the surface. This being the case, there is almost a certainty that new payable patches or veins will be opened for many years to come.

The formation is Silurian schists and sandstone, with belts of hornblendic granite.

There are at present four crushing machines, two at Ironbarks, one at Stoney Creek, and one at Muckerawa. They represent in the aggregate, 90-horse power, with 57 heads of stampers. The whole of this machinery was employed for quartz crushing purposes during my visit.

I would also draw the attention of the public to the Macquarie River Gold Field, above the junction of Oakey Creek with the Macquarie. I am confident that with proper machinery and a manager well versed in wet alluvial mining, the old river-bed would pay well.

The country between Orange and Ironbarks also deserves better prospecting. If unemployed miners with a few pounds sterling, would give this part a trial, instead of going to New Guinea, they would have a far superior chance of improving their pecuniary condition.

COAL AND SHALE.

Table compiled from Returns furnished by the Owners of Collieries, showing the quantity and value of Coal and Shale won during the year 1877, and the number of Miners employed in the Collieries.

Company.	Locality.	Miners Employed.			Quantity.	Value.	Remarks.
		Above Ground.	Under Ground.	Total.			
Coal.					Tons.	£ s. d.	
Australian Agricultural Co.	Newcastle. ...	108	709	817	246,449	....	
Waratah	,, ...	12	100	112	29,427	....	
South Waratah	,, ...	40	150	190	33,063	....	
Newcastle Wallsend	,, ...	140	420	560	145,000	....	
Co-operative	,, ...	61	446	507	177,606	....	
Lambton	,, ...	30	391	421	164,267	....	
New Lambton	,, ...	50	325	375	94,372	....	
Duckenfield	,, ...	50	230	280	148,698	....	
Brown's	,, ...	30	63	93			
Newcastle	,, ...	51	240	291	50,294	....	
Little Red Head ...	,, ...	...	...	...	....	....	Not at work.
Red Head	,, ...	...	...	...	....	....	Boring; no coal raised.
Goose Colliery	,, ...	1	4	5	1,793	....	
Bevan & Co.	,, ...	1	3	4	250	....	
Australasia	,, ...	30	20	50	1,240	....	
Alnwick	,, ...	...	...	...	....	....	Not at work.
Nott, Ward, & Co...	Four-mile Crk.	...	...	...	....	....	Not at work.
Jesmond	,, ...	...	...	...	....	....	Not at work.
Various Collieries ...	......	15	77	92	25,322	....	
Greta Coal & Shale..	Maitland	47	190	237	33,123	....	
Stony Creek	,, ...	...	...	...	....	....	Not at work.
Rathluba...............	,, ...	...	...	...	....	....	Not at work.
Rix's Creek	Singleton	1	1	2	485	....	
New Wallsend	Catherine Hill Bay.	...	...	...	....	....	Not raising coal.
Mount Wingen	Murrurundi ...	...	...	...	....	....	Not at work.
		667	3,369	4,036	1,151,389	711,172 17 1	

Coal and Shale—*continued.*

Company.	Locality.	Miners Employed.			Quantity.	Value.	Remarks.
		Above Ground.	Under Ground.	Total.			
Coal—*continued.*					Tons.	£ s. d.	
Bulli	Illawarra	68	206	274	121,392	....	
North Bulli	,, ...	...	...	...	....	....	Preliminary work in progress.
Mount Pleasant......	,, ...	34	95	129	50,277	....	
Osborne Wallsend...	,, ...	42	84	126	45,271	....	
Coal Cliff	,, ...	...	...	...	....	....	Preliminary work in progress.
Brereton's	Berrima.	...	...	...	....	....	Not at work.
		144	385	529	216,940	129,163 8 0	
Lithgow Valley......	Hartley.........	4	28	32	26,074	....	
Esk Bank	,, ...	4	17	21	21,891	....	
Bowenfells	,, ...	2	13	15	10,362	....	
Vale of Clwydd.....	,, ...	5	17	22	17,355	....	
Cooerwell	,, ...	...	2	2	260	....	
Bulkeley and Cock's	Wallerawang..	...	...	...	....	....	Not at work.
		15	77	92	75,942	18,662 3 1	
Shale.							
N. S. W. Shale and Oil Co.	Hartley Vale.	21	76	97	15,972	....	
Joadja Shale Mine. .	Berrima	6	2	8	600	....	Rock Roof Pit.
Australian Kerosene Oil & Mineral Co.	Joadja Creek..	9	6	15	50	....	
Mount Kembla	Wollongong...	2	13	15	2,341	....	
		38	97	135	18,963	46,524 10 0	

HARRIE WOOD,
Under Secretary for Mines.

Department of Mines,
Sydney, 15th April, 1878.

REPORT OF THE EXAMINER OF COAL FIELDS FOR THE COLONY OF NEW SOUTH WALES FOR THE YEAR 1877.

In accordance with the provisions contained in the 26th section of the "Coal Mines Regulation Act, 39 Victoriæ No. 31," I have the honor to submit the following information in respect to the condition and prospects of the various Coal Mines of the Colony for the year 1877; and also to submit a Report from the Inspector of Collieries for the half-year ending 31st December last.

In my last report I gave a general description of the state of the coal and petroleum oil cannel coal mines, and of the new mines opened out in the year 1876; also of the improvements that had been made in the ventilation, and those which were in progress. And after a general examination of the mines, I am glad to be able to report a very great improvement in them, and to state that they are generally well ventilated; and each colliery has its own set of special rules, which have been reported upon by me, submitted to the Minister, and gazetted.

Ventilation of the Australian Agricultural Company's Collieries.

The erection of the Guibal fan, boilers, chimney, &c., and construction of the necessary air-ways for ventilating the Australian Agricultural Company's Collieries is now completed and the fan is at work. It is 30 feet in diameter, and is guaranteed to discharge a continuous stream of air of 200,000 cubic feet per minute, which should ensure efficient ventilation for a much greater number of men and horses than those now employed in the mine, or which are likely to be for many years to come; so that we may expect a very great improvement in the ventilation of the mine, and great credit is due to Mr. Gregson, the General Superintendent, and Mr. Turnbull, the Colliery Manager, for the energy they have displayed on behalf of the company, and the works they have constructed at a very large outlay for providing the men with an adequate amount of ventilation which was so much required.

Accidents.

The year ended with no great disaster, although I much regret to say that the number of fatal and non-fatal accidents are considerably more than they have been in preceding years. In the year ending December 31st, 1876, there were four fatal and eight non-fatal accidents, ten of which happened from falls of coal, one from falling down a shaft, and the twelfth by drowning through falling into a sump hole, into which the deceased was at the time of the accident employed in guiding the water-buckets at the bottom of the new Glebe pit.

In the year just ended there were seven fatal and twenty-one non-fatal accidents,—four out of the seven occurred from falls of coal, the fifth from a fall of stone, the sixth through being over-run by a coal-tub, and the seventh through an engine-driver getting his foot caught in a cog-wheel whilst walking across the crank of the winding-engine.

Sixteen out of the twenty-one non-fatal accidents happened from falls of coal, two from being over-run and struck by coal-tubs, and three through being jammed between skips.

The evidence taken at the inquests, on every fatal accident which happened from a fall of coal, proved that there were plenty of props, spraggs, and lids supplied by the colliery officials, and that life was lost either from the miners' own negligence, or by accident over which neither men nor managers had any control. Falls of coal and roof are of daily occurrence, and there is consequently constant danger to be incurred by the men working in the mines; but if they would only use a little more caution, and take more trouble in propping the roof, whether it appeared necessary or not, and spragging the under-cut coal, there would be less accidents resulting therefrom. The following is an account of those I have examined and reported upon, also of an inquiry into an alleged and supposed attempt to set fire to the Anvil Creek Coal Mine.

FATAL AND NON-FATAL ACCIDENTS WHICH I HAVE REPORTED UPON.

Fall of Coal.

On the 22nd March I reported a fatal accident, from a fall of coal, which happened to an experienced miner named Robert Williamson, said to be 70 years of age, at the Australian Agricultural Company's Colliery.

2. The Newcastle District Coroner, F. J. Shaw, Esquire, held an inquiry into the cause of it on the 17th of March, which I attended, after having made an examination of the place where the accident occurred.

3. Early on the Saturday morning (the 17th of March) I proceeded down the Australian Agricultural Company's No. 2 Pit, and into the bord where the deceased was working at the time the coal fell upon him, and annex a sketch showing the state in which I found the place, and the work done by the deceased previous to the sad occurrence which resulted in his death.

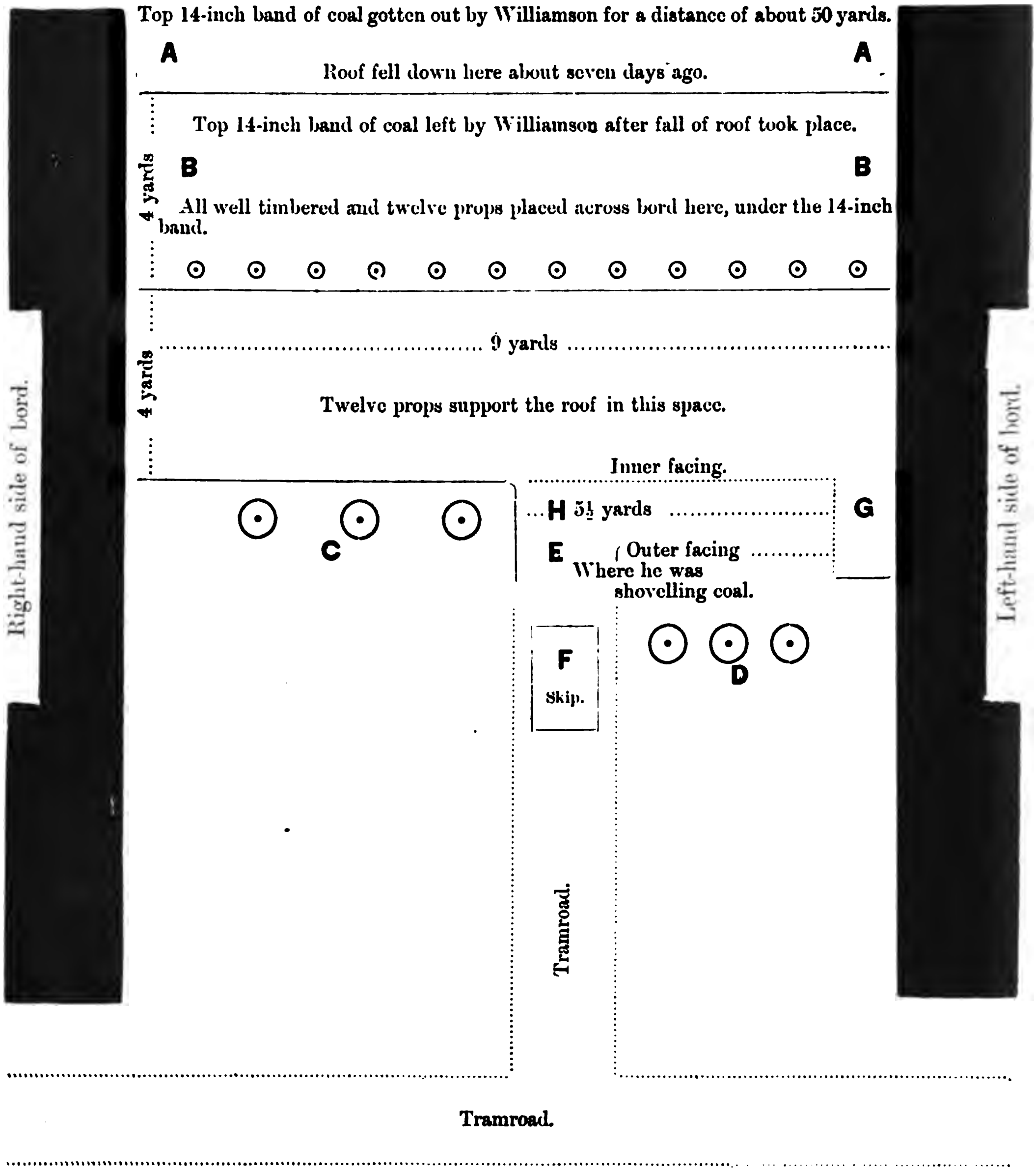
4. The deceased had brought back, about eight days before he was killed, the top 14-inch band of coal for a distance of about 50 yards, in a bord 9 yards in width, when a fall of the roof having taken place (see A on sketch), he then commenced and well-timbered 4 yards in length and 9 yards in width of the bord on the out-bye-side of the fall (see B), and cut up afresh from there 4 yards in length, and had three trees (props) to support the top 14-inch band of coal on each side of his drawing road, which is at the centre of the bord (see C and D), the three props on the right-hand side of the bord being only 2 feet 6 inches from the inner facing of the coal he was cutting across, and which caused his death.

5. He had abundance of trees and props ready for use in his bord.

6. It appears from an examination of the place, and the position in which the deceased was found, with a piece of coal about 2 feet square and 18 inches in thickness upon his back, and his shovel lying under him, that he was getting some coal he had previously fallen from the right hand side of his bord, and shovelling it into his skip (see E and F) when the accident happened. And I am of opinion that he should have removed this coal previous to cutting the top 14-inch band of coal from the inner facing through the outer facing (see G), or not have removed it without first putting some props under the top-band coal, 5½ yards in length (see G to H), and that he was killed through neglecting to do it. It was probably an after-thought of his to remove the coal lying under the top-band of coal he had cut across, and that he did it to prevent its being broken into smaller pieces.

7. It was stated in evidence that the deceased was an active man for his age, an old experienced miner of temperate habits, and a very careful man—the latter being borne out in the examination of the bord, and excellent manner he had timbered different places.

8. The jury returned a verdict of "Accidentally killed by a fall of coal."


Top 14-inch band of coal gotten out by Williamson for a distance of about 50 yards.
A
A
Roof fell down here about seven days ago.
Top 14-inch band of coal left by Williamson after fall of roof took place.
B
B
4 yards
All well timbered and twelve props placed across bord here, under the 14-inch band.
9 yards
4 yards
Twelve props support the roof in this space.
Inner facing.
H 5½ yards
G
C
E
Outer facing
Where he was shovelling coal.
F
Skip.
D
Right-hand side of bord.
Left-hand side of bord.
Tramroad.
Tramroad.

Reference.

E denotes where the deceased was found with his shovel under him.

F denotes the skip three-fourths full of coal which he was shovelling coal into.

G denotes where he cut across from inner through outer facing.

78/2732 Mines

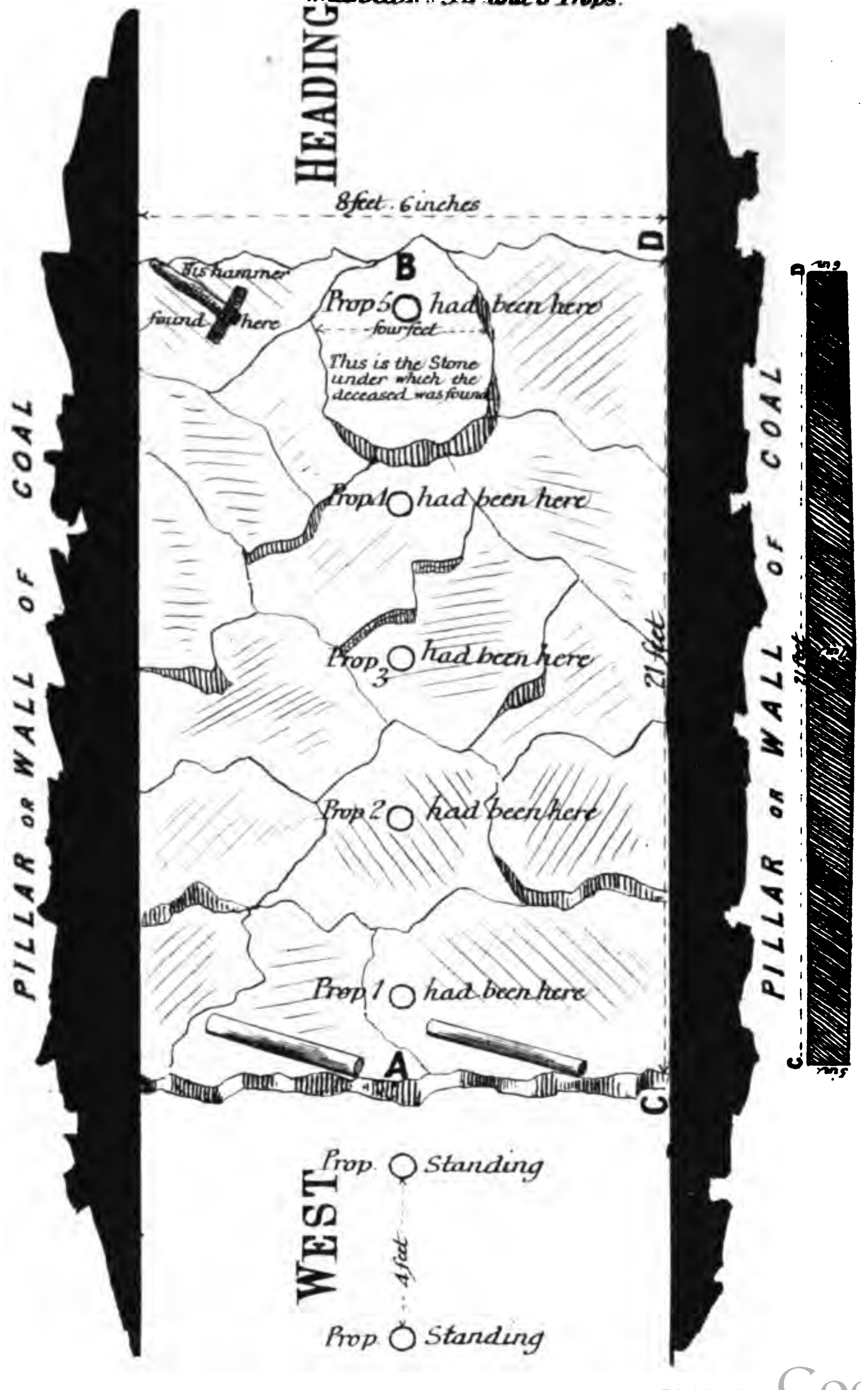
SKETCH

shewing the Scene of a fatal Accident

Waratah Compy's

"Charles Pit" Raspberry Gully

The Part from A to B and C to D shews the Mass of Stone fallen by the deceased Henry Young, and under which lie Nos 3 4 and 5 Props.



Section from C to D shewing its thickness of the Mass of Stone, from under which the Deceased drew the Props

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

Fatal Accident—Fall of Stone.

On the 27th of March I reported a fatal accident from a fall of stone which happened at the Waratah Company's Charles Pit at Raspberry Gully, to an experienced miner named Henry Young, said to be about thirty-five years of age.

2. The Newcastle District Coroner, F. J. Shaw, Esquire, held an inquiry into the cause of it on the 20th of March, which I attended after I had made an examination of the scene of the accident.

3. The Colliery Manager (Mr. Moody) sent me notice of the accident at 1 p.m. on the 19th of March, and I procured a conveyance at 2 p.m. and proceeded to the Charles Pit, where I found Mr. Moody and his over-man (Yates) awaiting me.

4. I then went down the pit with Mr. Moody and Yates, and examined the heading where deceased was working at the time of the accident.

5. The seam of coal is a new one, lately opened out by the Waratah Coal Company, and is worked differently to any other in this district. It is 10 feet in thickness, with a 6 inch stone band in the centre of it, the lower 5 feet portion of the seam of coal only having been worked, and the stone band (6 inches in thickness) forms the roof, which had props placed about 4 feet apart to support it.

6. Yates (the over-man) went with the deceased and his mate (William Moses) at about 10 a.m. on the 19th into the heading to show them where he wished them to take down the 6-inch stone band for the purpose of increasing the height of the heading, so as to allow bords to be opened out on the west side of it, and to make a better return air-course—the deceased and his mate having done similar work off and on for the last four months.

7. The place where Yates told them to commence getting down the stone was about 21 feet in length (see plan), and the stone was down on each side of it (see A to B on plan.)

8. Yates says he cautioned the men, as he always did, to be very careful and not go under the stone after the props had been drawn from under it.

9. From the evidence taken at the inquest, it appears that after Yates left them, William Moses (deceased's mate), went about 30 yards away to get a maul and wedges, and as he was returning he heard the deceased striking out props, and before he reached him he heard some stone fall and saw that his light was out and shouted out "Harry" but got no answer, and then found him killed under a large stone, and surrounded by stone which the deceased had fallen since he left him (for about 5 minutes). (See sketch.)

10. From an examination of the place, there appears no doubt that the deceased first knocked out the No. 1 prop at A, and then 2, 3, 4, and 5 props, and whilst he was under the stone and knocking out the fifth prop, the stone above came down and fell upon him. In some places the stone falls as soon as the props are drawn, sometimes it has to be wedged and occasionally blasted, and it is probable that the deceased did not anticipate that the stone would come down so readily, and if he drew a number of props before his mate returned, they would more easily wedge it down.

11. I am of opinion from from an examination of the scene of the accident, the evidence of the over-man, and that of deceased's mate, that Henry Young's death was caused by his acting contrary to the instructions given him, and over-anxiety to fall as much stone as possible in a short time.

12. The deceased was an experienced miner and said to be very careful and well suited for the work.

13. The jury returned the following verdict:—"Accidentally killed from a fall of stone."

Non-fatal Accident—Fall of Coal.

On the 22nd of May I reported a non-fatal accident which happened on the 15th to an experienced miner named Titus James, at the Australian Agricultural Company's No. 2 Pit, at Hamilton, near Newcastle.

The accident was not reported to me until the 17th of May, and I proceeded on the following day to the colliery and made an examination of the place where the accident happened. Titus James and his mate (Joseph Young), were working the top-band coal, 2 feet 6 inches in thickness, in a bord 8 yards in width; the lower portion of the seam of coal, about 9 feet in thickness, had been previously worked up to a fault at the far end of the bord, and on the 11th of May, James and his mate commenced working back the top-band coal at a distance of 4 feet from it, and on the 16th they had worked back 6 feet of it and had well timbered the roof. They left the 4 feet in width and 8 yards in length of the top-band coal so as to prevent the roof falling, as they knew the top-coal was tender and liable to fall near the fault; but on the morning the accident happened, James thought he could easily and cheaply get some of it down, and whilst doing so, and throwing some pieces into a skip, some of the top coal fell down on him, dislocated his shoulder, gave him a scalp wound, and several severe bruises about his body. He is progressing favourably under the doctor's care and says he only has himself to blame for the accident. There was plenty of timber in the bord.

Fatal Accident—Fall of Coal and Stone.

On the 2nd of August I reported a fatal accident which happened on July 31st, from a fall of coal and stone, to an experienced miner named Thomas Hibberd, at the Waratah Company's New Tunnel, at Waratah.

On receiving notice of the accident I proceeded to the colliery, and along with Mr. Moody (the manager) and Thomas Usher (the over-man) made an examination of the place where the deceased and his mate (Uriah Broom) were working at the time it happened.

Although this part of the Waratah Company's) Colliery is called the New Tunnel, there is now very little work to be done there besides getting out the pillars.

The deceased and his mate (Uriah Broom) were stripping and working out about eight feet of a pillar of coal 8 feet 6 inches in height. The pillar has a clay-dike on one side, and Broom and the deceased were stripping the pillar of coal up to the dike, and 8 feet in width from it. They had stripped it for a distance of about 11 feet, and Broom was wedging some coal from the face, the deceased being behind him shovelling the fallen coal into a skip, when a piece of coal and indurated clay-stone from the upper part of the dike fell upon the deceased. Broom tried to lift the coal, &c., which measures 4 feet by 3 feet, and 1 foot in thickness, but could not without the assistance of a crow-bar which he procured for the purpose. As soon as he removed the stone he found he was breathing, but insensible, and he died in a few minutes.

I found the place well timbered, and plenty of props and lids ready for use when required alongside where they were working.

F. J. Shaw, Esq., the District Coroner, held an inquiry into the cause of the accident on 1st of August, which I attended.

From the evidence of Broom, who is an intelligent and good practical miner of large experience in coal-getting, and who was working with the deceased at the time of the accident, there is no blame attributable to anyone, and it is one of those accidents in connection with coal-getting which no legislation or precautions would have prevented; and in cross-examination by myself he said:—

1. Neither he nor the deceased considered there was any danger when they commenced to work at this pillar of coal.
2. They had sounded the coal and stone at the side of the dike several times during the afternoon, and had taken down what was loose.
3. Did not think it would have been of any use, or practical, to prop, &c., the coal alongside the dike.
4. There was plenty of timber close to where they were working if they required it.
5. He and the deceased took all the precautions they possibly could.
6. The accident might have happened to himself, or any younger man than the deceased.
7. At the time of the occurrence he did not consider the place dangerous, or that any accident was likely to happen.

The over-man stated that he was in the place about two and a half hours before the fall of coal, &c., and it then appeared quite safe. He also told me that whilst he was there he said to Hibberd he must not get any coal from there after that day.

The Jury found the following verdict—"Accidentally killed."

Fatal Accident through getting Foot caught in the Crank of the Cog-wheel.

On the 23rd of August I reported an accident, which proved fatal, and happened on the 2nd of August, at the Anvil Creek Colliery, to an engine-driver named Alfred Clifford, who leaves a wife and six children to mourn his loss.

On the 7th I received, at this office, the following telegram from T. W. Pearse, Esq., the Maitland District Coroner: "Alfred Clifford died in hospital to-day from injuries received by the engine at Anvil Creek Colliery; inquest adjourned for your attendance till 3 o'clock on Thursday, the 9th instant."

On the 8th instant I proceeded to the Colliery to inquire into the cause of the accident, and why Mr. Farthing (the manager) had not reported it at this office. The man having been some days in the Maitland Hospital, and had his leg amputated previous to his death, some one on behalf of the Government should have seen him to ascertain whether he considered he was in any way to blame for the accident, or there could be anything attributable to the Colliery Managers. Mr. Farthing informed me, that on the 3rd instant his clerk sent notice of the accident, by post, to the Inspector's private residence at Lambton; and on my writing to Mr. Lewis on the 13th of August, to know if he had received it, the following reply came to hand: "In reply to your letter of the 13th instant, I have the honor to state that on my return home from the Southern and Western Districts, I found an unregistered notice from Mr. Farthing, dated 3rd instant, of an accident on the previous day to the engine-man. No name given."

If the notice had been sent to me at this office, as it should have been, instead of to Mr. Lewis's *private residence* at Lambton, an examination of the scene of the accident would have been made previous to Clifford's death; his evidence would have been taken by some one on behalf of the Government when he was in the hospital, the inquest attended, and the expense of an adjourned inquest saved. Mr. Farthing perceives the necessity of adopting this course in future, and promises to adhere to it, as *the office-keeper has instructions to immediately proceed to the Inspector's private residence* with any notices of accidents, &c., arriving during my absence, and to take a copy of the same.

From the examination of the scene of the accident, I am of opinion that it happened accidentally, and none of the colliery officials are blamable, and that it was caused by the deceased getting his foot caught in the crank of the cog-wheel when walking across the machinery (the pumping gear being at work at the time) to ascertain what someone was saying to him although he had been before told by Mr. Farthing not to do it.

At the adjourned inquest Mr. Farthing having been sworn, stated,—

By the Coroner: I am Manager of the Anvil Creek Colliery. Last Thursday, the 2nd instant, as the deceased was engaged at his work, I understood an accident occurred to the deceased. I was down the pit at the time, and I saw him afterwards at his hut. He told me that he had his foot nearly taken off with the engine. He was on the same day removed to the Maitland Hospital. I got the clerk to give notice to the Inspector of Coal Mines, in accordance with the "Coal Fields Act of 1876." The clerk afterwards posted the letter.

By the Examiner of Coal Fields: The letter was addressed to Mr. Lewis's private residence. I do not know if Mr. Lewis lives in Newcastle. I think that in future it would be better to address to the Coal Fields Office, and not to Mr. Lewis's. On this day there was a fire in the pit. I did not give notice of the fire. The fence was around the engine. It was not a fixture, but at the time of the accident it was there. I had warned the deceased not to step across the engine while it was going. Deceased was an engine-driver of considerable experience.

I have had no reply from Mr. Lewis in answer to my notice of the accident. The accident occurred on the Tuesday, and the deceased died on Monday night. I did not know the first inquest was going to take place. Deceased went down the shaft some two or three hours before the accident. There was no smoke in the shaft at the time. I am not aware if Mr. Lewis has received my notice.

The Jury returned the following verdict:—That the deceased came to his death from injuries accidentally received at the Anvil Creek Colliery, and that no blame is attachable to anyone; but would recommend a more substantial fence being erected round the engine.

Alleged and Supposed Attempt to set Fire to the Anvil Creek Coal Mine.

On the 31st of August I reported that on the 15th I received a letter from T. W. Pearse, Esq., the Maitland District Coroner, asking for information with respect to Constable Powell, of the police-station, Greta, having informed him that an attempt had been made to set fire to the Anvil Creek Coal Mine on the evening of the 1st instant. I replied that no information had been received at this office, but that I would go to Anvil Creek Colliery on the following day and inquire into it. On arriving there I proceeded with Mr. Farthing (the manager) to the tunnel, and found that some one had evidently placed some timber together and lighted a fire in the tunnel which the men went down and up when going to and from their work in the mine; and that on the evening of the 1st instant, and previous thereto, a fire had again broken out near the winding shaft, and a large volume of smoke, heavily charged with sulphur, was then going up it, which would have made it dangerous to take the men out of the mine by the cage and shaft if the tunnel had taken fire and fallen in.

The Coroner decided to hold an inquiry into it on the 21st instant, which I attended, also an adjourned inquest on the 25th instant, when the jury returned the following verdict—"The jury are of opinion that a fire was improperly lighted in the travelling tunnel of the Anvil Creek Colliery on the 1st instant, which endangered the lives of several miners, but by whom or whether by accident or design there is no evidence to show."

Non-fatal Accident—Fall of Coal.

On the 23rd October I reported a serious accident which happened on the 9th to a miner named Griffith Griffiths, at the Australian Agricultural Company's Colliery, at Hamilton, near Newcastle.

From an examination of the scene of the accident, and what Griffiths himself says, I am of opinion that there is no blame attributable to the colliery manager or officials.

Griffiths and his mate were working in a heading 6 feet in height and 7 feet in width, getting down the little tops (coal), and had fired a shot and got down a portion of them 3 feet 8 inches by 3 feet 6 inches and 2 feet 4 inches in thickness.

It was then near knock-off time, and they required a little more coal to finish filling the skip, more than two-thirds full, and Griffiths was in the act of throwing some of the fallen coal into the skip, when a large lump of the little tops (2 feet 6 inches by 2 feet and 2 feet 4 inches in thickness) hanging on the left hand side of the heading, came down unexpectedly and hit him on the shoulder, knocking him down and falling upon his back. He is still suffering very much from the effects of the fall of coal, and is badly bruised on his back and face, but the doctor hopes that he will in a short time be able to resume work.

Non-fatal Accident—Fall of Coal.

On the 29th of October I reported a serious accident which happened on the 8th to an experienced miner named David Morgan, at Brown's Duckenfield Colliery, near Hexham.

My attention having been called to an account in the local newspapers of an accident at this colliery, I went there on the 19th of October, and upon inquiry found that the notice of accident had been sent to *Mr. Lewis's private residence at Lambton* (instead of to the Coal Fields Office at Newcastle) at a time when he was away inspecting the Southern and Western collieries. If it had been sent to this office, I should have been able to have visited the scene of the accident previous to work having been resumed in the bord where it happened. As usual, the manager left the place unworked for forty-eight hours after the accident happened; but as the Inspector, to whom he had sent notice, did not come, he started other men to work in it, which prevented my being able to see the state it was in at the time of the accident, and to inform you—in accordance with the provisions contained in the 28th section of the Coal Mines Regulation Act—whether in my opinion such accident was caused by any default or negligence of the colliery officials.

I have asked the manager to send all notices of accidents to this office in future, so that I can if possible examine the scene of them before the expiration of forty-eight hours from sending the notice, or instruct the Inspector to do so as was formerly the custom.

I have been into the bord where Morgan was working at the time he met with the accident, and called at the hospital, where he is progressing favourably. He says he had holed along the whole face of his bord 8 yards in length; the coal he was getting was 5 feet 6 inches in height, the depth of the holing about 1 foot and 3 feet in width. Whilst doing this about 12 cwt. of coal fell upon his leg and broke it.

The coal has very irregular facings, and is generally spragged after holing under it 2 feet; but but Morgan's mate said he objected to spragging before he had holed 2 feet, as it would interfere with their working, and that he had frequently sounded the coal holed under to ascertain if it was safe.

Morgan considers he has only himself to blame, and says that there were plenty of spraggs and timber in the mine if he had thought fit to use them, which I consider he should have done.

Non-fatal Accident—Fall of Coal.

On the 3rd of November I reported an accident which happened at the Australian Agricultural Company's Colliery, through a fall of coal, to an experienced miner, Abraham Waters, on the 31st October.

On the 2nd of November I proceeded to the colliery and made an examination of the scene of the accident, and found it to be as follows:—

Waters and his mate, Henry Burt (another experienced miner), were getting down the little tops (coal) in a galley road which is 4 yards in width and about 5 ft. 6in. in height. The lower portion of the seam of coal, 2 ft. 9 in. in height, and up to the bottom of the little tops (top of jerry wag) had been previously wrought, and Waters and his mate had been at work about one month in the place getting down the little tops. At the time the accident happened Burt had cut the little tops 2 ft. 6 in. in depth up to a facing on the left-hand rib, and Waters was kneeling down cutting the right-hand rib, and had cut through to within about 3 in. of the facing on the lower part of the little tops, under which they had no jerry props, when the whole of the little tops cut across came down sooner than they expected, some of it hitting him on the head and falling on his leg and knee. Waters told me he never uses props to support such coal whilst cutting it, and does not consider them necessary, and that he did not ask any of the officials for jerry props, as he did not wish to have them, although there were plenty in the mine. He is progressing favourably, and as the accident would most probably not have happened if he had placed jerry props under the top coal, I consider it was caused by Waters's own act in not propping it, which he says he should not do if he again works in a similar place.

Non-fatal Accident—Fall of Coal.

On the 20th of November I reported on an accident from a fall of coal which happened on the 15th of November to an experienced miner, Alexander Logan, at the Co-operative Colliery. On the 16th, I proceeded to the scene of the accident and saw Logan's father, who was working in a 7-yard bord with him at the time the accident happened. The bord had only been driven about 2 yards from the heading, and the coal they were working was 5 ft. 9 in. in height, and has very irregular facings. Alexander Logan had holed under about 4 ft. in length of the coal at the face of the bord and near the centre of it for a depth of only 9 in., when about 1 cwt. of coal fell down from an irregular facing, hitting him on the shoulder and breaking his collar-bone. He is progressing favourably, and the accident was purely accidental, and no blame is attributable to anyone.

The Returns which have been collected and forwarded to me by the Mining Department show the following figures for the year 1877 :—

COAL RETURN.

	Northern District.	Southern District.	Western District.	Total.
Tons of round and small coal raised	1,151,389	216,940	75,942	1,444,271
Value of round and small coal raised	£711,172 17s. 1d.	£129,163 8s.	£18,662 3s. 1d.	£858,998 8s. 2d.
Persons employed above ground ...	667	144	15	826
Persons employed underground ...	3,369	385	77	3,831

PETROLEUM OIL, CANNEL COAL, AND PETROLEUM OIL SCHIST RETURN.

	Southern and Western Districts.
Tons of petroleum oil cannel coal, and schist raised	18,963
Value of petroleum oil cannel coal, and schist raised	£46,524 10s.
Persons employed above ground	38
Persons employed underground	97

NORTHERN DISTRICT.

Comparative statement of returns for 1876–7.

	Men above ground.	Men under ground.	Tons of round and small coal raised.	Value.		
				£	s.	d.
Australian Agricultural Co-operative, Newcastle Wallsend, Waratah, South Waratah, Lambton, New Lambton, Duckenfield, Brown's, Newcastle Coal, Ferndale, Australasia, Greta, Anvil Creek. Alnwick, Goose, Rix's Creek, and Rathluba, &c., Collieries	667	3,369	1,151,389	711,172	17	1
Total in 1877	667	3,369	1,151,389	711,172	17	1
Total in 1876	545	2,935	1,062,531	666,576	2	2
Increase in 1877	122	434	88,858	44,596	14	11

SOUTHERN DISTRICT.

Comparative statement of returns for 1876–7.

	Men above ground.	Men below ground.	Tons of round and small coal raised.	Value. £	s.	d.
Bulli, North Bulli, Illawarra Coal, and Osborne Wallsend Collieries	144	385	216,940	129,163	8	0
Total in 1877	144	385	216,940	129,163	8	0
Total in 1876	161	367	200,284	120,305	2	0
Increase in 1877	......	18	16,656	8,858	6	0

It appears there has been a decrease of 17 men employed above ground in 1877.

WESTERN DISTRICT.

COMPARATIVE Statement of Returns for 1876–7.

	Men above ground.	Men under ground.	Tons of round and small Coal raised.	Value. £	s.	d.
Esk-bank, Lithgow Valley; Vale of Clwydd, Bowenfells; and Cooerwell Collieries	15	77	75,942	18,662	3	1
Total in 1877	15	77	75,942	18,662	3	1
„ 1876	12	64	57,103	16,419	1	4
Increase in 1877	3	13	18,839	2,243	1	9

From these returns, we find that notwithstanding the continued general depression during the past year in the coal, iron, and other trades throughout Great Britain and other countries, our coal trade shows a steady increase in every district of this Colony, which I anticipated in my Report for 1876.

The greatest increased yield and value is in the Northern District (88,858 tons, valued at £44,596 14s. 11d.), and the next largest in the Western (18,839 tons, valued at £2,243 1s. 9d.), being about the same as it was in 1876 above 1875, viz., 18,291 tons, whilst the Southern increase is only 16,656 tons, valued at £8,858 6s.

THE following Table shows comparisons between the year under notice and the two preceding years, as regards the tons of round and small coal raised for each person employed in and about the Collieries ; value of round

Years.	Exports to Intercolonial Ports.			Exports to Foreign Ports.			Total Exports.			Home Consumption.
	Quantity.	Average per ton.	Value.	Quantity.	Average per ton.	Value.	Quantity.	Average per ton.	Value.	
	Tons.	£ s. d.	£	Tons.	£ s. d.	£	Tons.	£ s. d.	£	Tons.
1875	518,853	0 13 7·77	354,074	408,154	0 15 6·64	317,409	927,007	0 14 5·84	671,483	402,722
1876	542,952	0 13 8·45	372,045	325,865	0 15 6·45	253,166	868,817	0 14 4·7	625,211	451,101
1877	563,757	0 13 8·64	386,740	351,970	0 14 10·08	262,237	915,727	0 14 2·08	648·977	528·544
Totals	1,625,562	0 13 8·30	1,112,859	1,085,989	0 15 4·05	832,812	2,711,551	0 14 4·21	1,945,671	1,382,3[illegible]

From the above we find that in the year 1877 we exported 20,805 tons more coal to Intercolonial Ports than in the preceding year, and 26,105 tons less to Foreign Ports, whilst our total Exports exceeded those of 1876 by 46,910 tons, and the Home Consumption by 77,443 tons. The total output of coal for the last year exceeded that of 1876 by 124,353 tons. It will also be seen that the quantity of coal raised during the last three years for each person employed in above and underground work at the collieries has averaged 339 tons of round and small coal per year, and that each person so employed added £205 19s. 4d. per annum to the wealth of the Colony.

In the years 1875, '76, and '77, nineteen lives were lost for 4,093,918 tons of coal raised—that is, 215,469 tons for each life lost; whilst in Great Britain, in the year 1874, 133,251 tons of coal only were got for each life lost, and in 1873, 133,677 tons. But considering we have no explosive gas to contend with in our coal mines, and are at present exempt from those fearful explosions attended frequently with great loss of life, I think the accidents are greater in proportion to the quantity of coal raised than they ought to be if a little more care was exercised by many miners in propping the roof and spragging the coal, &c.

These figures appear to me to be sufficiently explanatory in themselves, so far as a comparison of Export and Home Consumption, &c., for the whole Colony is concerned, but I think it may also be interesting for each district to know the proportion the accidents and deaths bear to the persons employed, and the quantity and value of coal raised for each person employed in and about the mines, &c., which is as follows :—

NORTHERN DISTRICT.

Number of persons employed in and about the mines	**4,036**
Number of persons employed underground	**3,369**
Quantity of coal raised, in tons	**1,151,389**
Number of non-fatal accidents...	**19**
Number of lives lost by accidents	**7**
Persons employed per each non-fatal accident..	**212**
Persons employed per each life lost	**576**

Exports of Coal to Foreign and Intercolonial Ports ; the quantity used for Home consumption ; total output and value ; nd small coal raised for each person so employed ; and the quantity of coal raised per life lost.

Total Output and Value.			Coal raised per each person employed in and about the Mines.			Value of Coal raised per each person employed in and about the Mines.			Tons of Coal raised per life lost.		
Quantity.	Average per ton.	Value.	Quantity.	Average tons per each person employed.	Persons employed.	Value.	Average value per each person employed.	Persons employed.	Quantity.	Average tons per each life lost.	Lives lost.
Tons.	£ s. d.	£ s. d.	Tons.	Tons.	Number	£	£ s. d.	Number	Tons.	Tons.	No.
1,329,729	0 12 3·89	819,429 17 2	1,329,729	401	3,308	819,429	247 14 2	3,308	1,329,729	166,216	8
1,319,918	0 12 2·06	803,300 5 6	1,319,918	323	4,084	803,300	196 13 8	4,084	1,319,918	329,979	4
1,444,271	0 11 10·74	858,998 8 2	1,444,271	310	4,657	858,999	184 9 0	4,657	1,444,271	206,324	7
4,093,918	0 12 1·43	2,481,728 10 10	4,093,918	339	12,049	2,481,728	205 19 4	12,049	4,093,918	215,469	19

NORTHERN DISTRICT—*continued.*

Tons of round and small coal raised per each non-fatal accident	60,599
Tons of round and small coal raised per life lost	164,484
Tons of coal raised per each person employed in and about the mines	285
Tons of coal raised per each person employed underground	341

	£ s. d.
Value of coal raised	711,172 17 0
Value of coal raised per each person employed in and about the mines	176 3 0
Value of coal raised per each person employed underground	211 1 0

SOUTHERN DISTRICT.

Number of persons employed in and about the mines	529
Number of persons employed underground	385
Quantity of coal raised, in tons	216,940
Number of non-fatal accidents	3
Number of lives lost by accidents	nil
Persons employed per each non-fatal accident	176
Persons employed per each life lost	No life lost
Tons of coal raised for each non-fatal accident	72,313
Tons of coal raised per life lost	No life lost
Tons of coal raised for each person employed in and about the mines	410
Tons of coal raised for each person employed underground	563

	£ s. d.
Value of coal raised	129,163 8 0
Value of coal raised per each person employed in and about the mines	244 3 3
Value of coal raised per each person employed underground	335 9 8

WESTERN DISTRICT.

Number of persons employed in and about the mines	92
Number of persons employed underground	77
Quantity of coal raised, in tons	75,942
Number of non-fatal accidents	nil
Number of lives lost by accidents	nil
Persons employed per each non-fatal accident	no accidents
Persons employed per each life lost	no life lost
Tons of coal raised per each non-fatal accident	no accidents
Tons of coal raised per life lost	no life lost
Tons of coal raised per each person employed in and about the mines	825
Tons of coal raised per each person employed underground	986

	£	s.	d.
Value of coal raised	18,662	3	1
Value of coal raised per each person employed in and about the mines	202	17	0
Value of coal raised per each person employed underground	242	7	3

Lithgow Valley Company's Brick Works, &c.

The Lithgow Valley Coal Company have erected near their coal mine large works for the manufacture of earthenware pipes, fire-bricks, terra cotta, and all descriptions of pottery. A powerful disintegrator, pipe and brick machine, pug mills, &c., with all the latest improvements, have been ordered in England, and in January last they were daily expected to arrive. Sheds and a substantial well-built stack 60 feet in height, as well as an arched kiln, and 35-horse power engine and boiler are already erected. Pending the arrival of the machinery, pipes, tiles, &c., are being made by machines driven by horse-power. The pipes and tiles are of superior quality. To complete the works tramways are to be laid down, one to bring coal from the tunnel mouth to the kilns, and convey back manufactured goods to the railway siding for loading into waggons. Another tramway will bring fire and other clays to the disintegrator and pug mills.

They have also during the year erected near the tunnel mouth a 6-horse power winding engine for drawing the skips out of the mine, and are drawing out about 3 tons of coal at one time. A weighing machine has likewise been put up near the screens.

A township has been laid out, and a telegraph office and stores erected during the year.

Esk-bank Ironworks, Lithgow.

The Esk-bank Ironworks, Lithgow, are erected on coal property belonging to Thomas Brown, Esq., at Lithgow Valley, adjoining the Great Western Railway, and are situated about 95 miles from Sydney, 50 miles from Bathurst, and 97 miles from Orange. The blast furnace is 55 feet in height and 12 feet across the boshes, and is driven by a 70-horse power horizontal engine, with hot air oven, and all other appliances necessary for a first-class blast furnace.

Last December they were producing pig-iron at the rate of about 100 tons per week. The iron ores used are clay-band, from the property on which the works are erected, brown hematite from Back Creek, near Blayney, situated about 77 miles west from the works by rail (the Great Western Railway running through the deposit); also red silicious hematite from the Company's property at Mount Wilson, alongside the Great Western Railway, and about 12 miles from the works, and brown hematite from the Clarence Tunnel, adjacent to the Great Western Railway, and about 7 miles from the works. Limestone is procured from Piper's Flat, a distance of 14 miles from the works, and 7 miles from the Wallerawang Railway Station. The coal used is the Esk-bank Colliery splint coal, burns to a white ash, and is procured from a 10 feet 6 inches seam adjacent to the blast furnace. The company have also erected during the year a foundry for making their own castings for the rolling mills, furnaces, &c. The rolling mill consists of a 100-horse power engine, 18-inch mill, six puddling furnaces, one ball furnace, and two mill furnaces, a Nasmyth steam hammer, and all the necessary appliances for converting pig into bar iron on the premises; and they are now importing and making the plant necessary for the manufacture of galvanized iron. Enoch Hughes, Esq., is the manager.

Esk-bank Smelting Works.

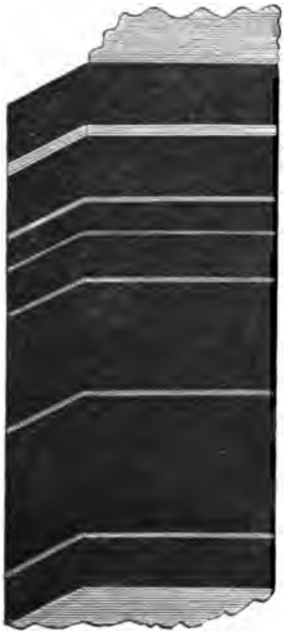
The Esk-bank Copper Smelting Works have made about 630 tons of refined copper during the year from copper ores procured from Wiseman's Creek, near Bathurst, and splint coal procured from Thomas Brown, Esq., Esk Bank Colliery.

Vale of Clwydd Colliery and Emu Smelting Works.

A brick shed with four flues has been erected for drying and making fire-bricks for the Emu Smelting Works, belonging to Thomas Saywell, Esq., and let by him to Messrs. Newton, Bensusan, and others. This company have made a considerable quantity of refined copper during the year, the copper ore principally coming from the Northumberland Copper Mine, at Dirty Swamp, near Lock's Platform, and some from the Frogmore Mine, in the Southern District. They have also erected a lime-kiln near the smelting works and coal pit. A township has been laid out, and a commodious hotel completed within a short distance of the colliery and smelting works.

Sections of seams of Coal opened out and worked at various places during the year:—

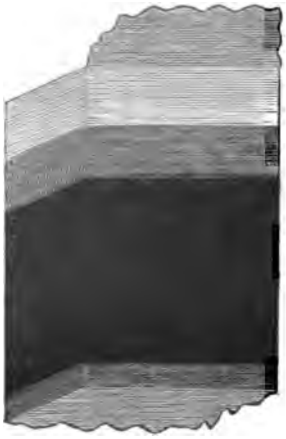
Oberwull Coal Mine.



Sandstone	ft.	in.
Coal	1	3
Band	0	3
Coal	1	3
Band	0	1
Coal	0	8
Band	0	0¼
Coal	0	11
Band (present roof)	0	0¼
Coal	2	3
Band	0	1
Coal worked at present is 5ft 5in.		
Coal	8	0
Band	0	1
Coal (floor)	1	0
Total thicknes of seam of coal, 5ft. 5in. of which is now worked	10	10½

This represents a section of the seam of coal, 10 feet 10¾ inches in thickness, opened out by Andrew Brown, Esq., on his property at Lithgow Valley, and adjacent to the Lithgow Valley Colliery. It is a splint coal, suitable for steam, household, smelting, gas, blacksmith, and other purposes, appears to dip to the east, burns to a white ash, and is identical with the seam of coal worked at the Lithgow Valley, Bowenfels, Esk-bank, and Vale of Clwydd Collieries. The coal is worked from an adit for household use, and the Coerwull Tweed Factory, on a very limited scale, only one heading having as yet been driven about 70 yards into the seam.

New South Wales Shale and Oil Company's Mine, at Mount York, near Little Hartley.

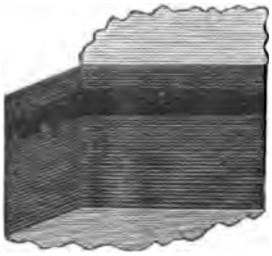


	ft.	in.
Hard blue shale.		
Fireclay	1	3
Black shale (tops, non-bituminous)	1	0
Petroleum oil cannel coal (best) 3ft. 6in. to 4ft.	4	0
Petroleum oil cannel coal (second best, called "bottoms")	0	6
Total thickness of petroleum oil cannel coal seam	4	6

The above section represents the exceedingly rich and thick petroleum oil cannel coal seam, where it has lately been opened out by the New South Wales Shale and Oil Company, on the eastern side of their deposit, and near to where the old Western Company formerly worked it. A heading has been driven into it, "bords" opened out, and a tramway constructed from the mouth of the heading to the bottom of the incline; and a splendid block, showing the whole height of the seam, has been sent from this portion of their workings to the Paris Exhibition.

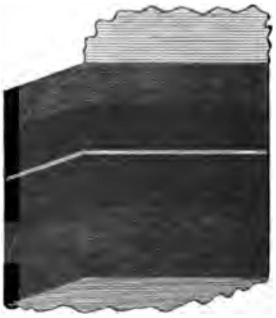
Messrs. Parbury, Lamb & Company's Petroleum Oil Cannel Coal Mine at Joadja Creek.

No. 1.



Conglomerate.	ft.	in.
Coal	0	6
Petroleum oil cannel coal	0	6
Coal and shale	2	0
Hard blue shale (floor)	3	0

No. 2.



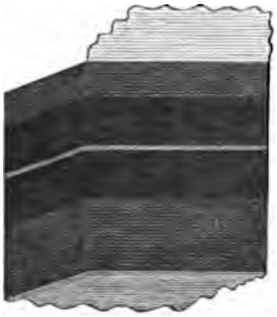
Conglomerate	ft.	in.
Bituminous coal	0	8
Petroleum oil cannel coal	1	0
Indurated clay	0	1
Petroleum oil cannel coal	1	0
Coal and shale (hole in this)	1	6
Total thickness of hard blue shale, petroleum oil cannel coal, and shale	4	3

The above sections represent the petroleum oil cannel coal seam worked by Messrs Parbury, Lamb & Company at Joadja Creek, near Berrima, in the county of Camden.

No. 1 section denotes the seam at the edge of the deposit, and No. 2 near the centre, and where they have driven in a heading and erected shoots for sending down the cannel from the mouth of the heading to a tramway constructed in the valley below. The petroleum oil cannel coal is of excellent quality, lies very flat, is easily and cheaply wrought, and sections of the seam, similar to that at No. 2, have been laid bare in five other places on Messrs. Parbury, Lamb & Company's conditionally purchased lands, &c.

A 40-horse power engine has been erected on the range opposite to where they are driving into the petroleum oil cannel coal, and an incline made 38 chains in length, from the bottom of which a tramway is constructed to the shoots and mine. The tramway is so constructed that the full waggons (with brakes on) run down by their own gravity from the bottom of the shoots to near the foot of the incline, and mules draw the empty return waggons back to the shoots. Mr. Jones is the Manager, and the works have been laid out under the general superintendence of Mr. Fell. It is the intention of the proprietors to erect oil works in the valley below the mine, and manufacture kerosene, paraffine, lubricating oils, &c., from this mineral. The distance from the mine to the Great Southern Railway near Nattai is about 16 miles, and it is intended to construct a tramway thereto.

Mr. Carter's Petroleum Oil Cannel Coal Mine at Joadja Creek.

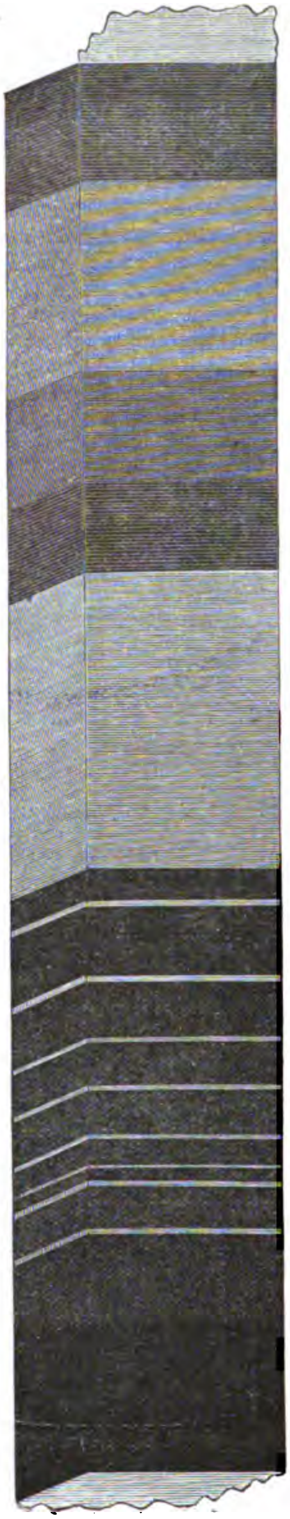


	ft.	in.
Conglomerate.		
Bright bituminous coal	0	9
Petroleum oil cannel coal, 9 inches to 11 inches	0	11
Indurated clay, ¼ inch to 1 inch	0	1
Petroleum oil cannel coal, 1 ft. to 1 ft. 1 inch	1	1
Coal and shale (hole in this).....................	1	6
Hard blue shale		
Total thickness of petroleum oil cannel coal and coal and shale	4	4

The above section represents the petroleum oil cannel coal seam now being worked by Mr. Carter, on land adjoining Messrs. Parbury, Lamb & Company's at Joadja Creek, near Berrima, in the county of Camden. About 600 tons of petroleum oil cannel coal have been raised by Mr. Carter and carted to the Nattai Railway Station, a distance of about 16 miles, where it was put into railway waggons, and from thence shipped to Sydney.

The petroleum oil cannel coal is of excellent quality, lies very flat, and is easily and cheaply wrought.

A wooden incline with drums and rope erected thereon have been put up near the mouth of the heading and entrance to the mine, the full waggons pulling the empty waggons from the valley below. At the range opposite to this heading an incline plane about 12 chains in length has been made, and a whim erected. The whim is worked by two horses and draws one waggon holding 8 cwt. of petroleum oil cannel coal to the top of the range in about 25 minutes, an empty waggon going down as the full one is drawn up.



Brereton's, Cataract Creek, and Atkinson's Seam of Coal.

Conglomerate.	ft.	in.
Black shale	2	6
Chert rock	4	0
Black metal and shale	2	2
Coal and shale	2	0
Blue silicious shale with a few thin bands of coal	6	3
Hard splint coal (heavy)	0	8
Band 1 to 2 inches	0	
Hard splint coal (heavy)	1	5
Stone band	0	2
Hard splint coal	1	2
Indurated clay	0	1
Splint coal	0	10
Indurated clay	0	1
Splint coal	0	11
Indurated clay	0	0½
Splint coal	0	6
Indurated clay	0	0½
Coal	0	3
Indurated clay	0	2
Bituminous coal	1	0
Indurated clay	0	2
Bituminous coal (worked)	4	10
Total thickness of strata and seam of coal	29	5

This represents a section of the seam of coal and over-lying strata known as Brereton's, Cataract Creek, and Atkinson's mine, situated about 2½ miles from the town of Berrima, and about 7 miles from the Great Southern Railway, in the County of Camden. The coal worked is about 4 feet 10 inches in thickness, is bituminous, burns to a whitish ash, has a very slight dip east to south-east, and is suitable for steam, household, smelting, blacksmith, gas, and coking purposes. Five tons from Brereton's mine have been tested by the Railway Department and favourably reported upon by them; Mr. Rae, in a letter dated 10th February, 1875, having informed Captain Onslow, M.L.A., "that the coal forwarded from the Berrima coal mines for trial has been tested and found suitable for locomotive purposes."

Coal Cliff Colliery, near Bulli.

	ft.	in.
Grey post.		
Coal 5 ft. 10 in. to	6	0
Fire-clay.		
Total thickness ...	6	0

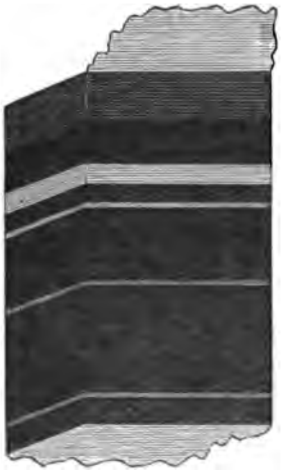
This represents a section of the seam of coal worked at the Coal Cliff Coal-mining Company's Colliery, belonging to the Hon. Alexander Stuart, M.L.A., and others, situated at Coal Cliff, in the county of Cumberland, and about thirty-four miles south of Port Jackson, being twenty-one miles nearer to the metropolis than any other mine now worked, and is the most important new colliery enterprise I have to report in the Southern district during the year.

The coal outcrops on the coast, above sea level, is about 6 feet in thickness, lies very flat, is very clean, easily and cheaply worked, and is identical with the seam of coal worked at the Bulli, Illawarra Coal Company's, and Osborne Wallsend Collieries. The coal is well suited for steam, household, smelting, blacksmith, and other purposes.

The property originally belonged to Sir Thomas Mitchell, and afterwards to his son, Campbell Mitchell, Esquire, for whom I made a report in August, 1864. Mr. Mitchell opened out the coal in several places; but inability to induce any one to join him in the venture, and the cost likely to be incurred in constructing a place for shipment of the coal, caused him to sell the property. Mr. Hale, with his foreman Mr. De Flon, readily surmounted all the difficulties which were apprehended with regard to the construction of a jetty at the entrance to the mine; and to show the difficulties they had to contend with I cannot do better than quote the following account from a Wandering Reporter's notes:—"At the outset of the operations considerable difficulty was encountered in obtaining sufficient foundation at the foot of the cliff, no land of any kind being available, and the whole of the structure necessary for the commencement of the jetty, workshops, &c., had to be erected upon a very rough beach, where gigantic boulders were utilized in the work. This had to be erected 20 feet above the sea level, and the jetty runs out from that height into the ocean, with a very gradual incline, to facilitate the movement of the waggons for shipment of cargo on the substantial timber platform, which in some parts is not less than 60 to 70 feet in width, are erected the steam boiler, shed, office, store-room, blacksmiths' shop, carpenters' shop for building truck and skips for the mine, and in each department work is being actively carried on. At the entrance to the main tunnel covered screens for screening coal have also been erected, and two tunnels have already been opened 400 feet under the mountain, and preparations are being made for opening 'bords' for producing a quantity of coal as soon as shipping arrangements are completed. The distance from the coal screens to the present extremity of the jetty is 500 feet, and the jetty itself is constructed of turpentine piles in such a manner as to permit the seas, however heavy, to pass through with as little obstruction as possible. The difficult work has been carried out on the same principle as that adopted by Mr. Hale in other open roadstead jetties, and the present structure is braced diagonally with cross-bars of iron, thus offering less resistance to the water than timber stays. The depth of the water at the end of the jetty is 20 feet, and the platform (along which runs a double line of rail) is 20 feet above high-water-mark. About ½ a mile from the mine, and for the convenience of work, a number of well-built weatherboard cottages with galvanized iron roofs have been erected for the workmen, and are now known as the village of Clifton."

Since the above was written several shipments of coal have been made, and great praise is due to Mr. Hale and his foreman Mr. De Flon, for the immense difficulties which they have surmounted in such a short space of time, and the energy they have displayed in bringing the mine into thorough working order. The Honorable Alexander Stuart, M.L.A., is the principal proprietor, and I anticipate that a considerable quantity of coal will be raised and shipped from this mine in the year 1878.

Rathluba Colliery, Four-mile Creek.

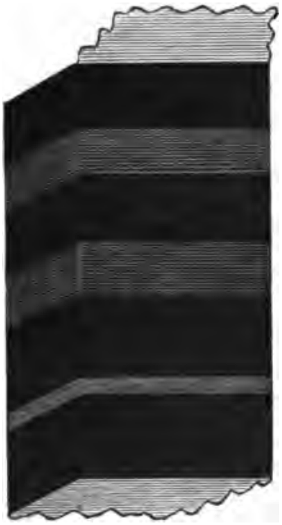


	ft.	in
Fine conglomerate.		
Black shale and indurated clay, 11 inches.		
Coal	0	11
Indurated clay	0	5
Coal (roof)	0	3
Indurated clay, 2 inches to	0	1
Splint coal	1	6
Black stone	0	1½
Coal worked 4 ft. 8 in.		
Splint coal	2	3
Black stone	0	1½
Coal	0	8
Total thickness of seam, 4 ft. 8 in. of which is worked	6	4

The above represents the seam of coal opened out by Mr. Hall at Rathbula, near Four-mile Creek, in the county of Northumberland. The coal is worked from a tunnel, and is suitable for steam, household, smelting, gas, and blacksmith purposes. A shaft 104 feet in depth has been sunk to this seam of coal, towards which the tunnel is being driven, and when it is through it will improve the ventilation of the mine.

The report of Mr. Hickey, Engineer to the Hunter River Steam Navigation Company, upon 39 tons of coal tested in one of their steamers, is as follows:—"The coal is clean, and burns to a white ash; no clinker. The consumption per hour is 34 cwt., and the ash 25 per cent. They are a fine steaming coal, soft and caky; in fact, they are the Four-mile Creek coal."

Australasia Colliery, Newcastle.

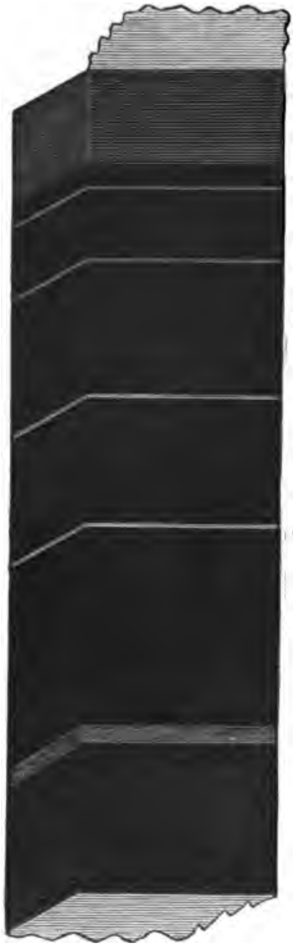


		ft.	in.
Sandstone.			
Coal (present roof)		1	4
Coal (inferior)		0	11
Coal		1	6
Coal (inferior)	Coal worked 6 ft. 5 in.	1	1
Coal		1	9
Soft clay		0	5
Coal		1	8
Total thickness of seam, 6 ft. 5 in. o which is worked		8	8

The above section represents the seam of coal opened out and worked at the Australasia Coal Company's mine, near Charlestown, in the county of Northumberland. The coal where opened out by an adit, is 8 feet 8 inches in thickness, dips about 1 in 32 to the south-west, and is suitable for steam, household, smelting, blacksmith, and other purposes. One of Robey's portable engines, 17 nominal horse power, draws ten skips (holding 12 cwt. each) out of the mine at one time, which then descend down an incline about 500 yards in length to screens erected alongside the Company's railway, which joins the great Northern line at a distance of 4½ miles from the Newcastle harbour. In October last there were two screens and a platform (pit top), covered in with galvanized iron, erected, and two more were in course of erection.

The first train of coal left the mine for the junction and Newcastle harbour on the 20th of October.

Ferndale Colliery, Newcastle.



	ft.	in.
Sandstone.		
Smut and clay, 2 ft.		
Coal	**0**	**6**
Band	**0**	**0½**
Coal	**1**	**6**
Band	**0**	**0½**
Coal	**2**	**8½**
Band	**0**	**1**
Coal	**2**	**7**
Band	**0**	**1**
Coal	**4**	**3**
Coal and bands (Jerry wag)	**0**	**4**
Coal	**3**	**2**
Total thickness	**15**	**8**
Grey post.		

This represents the seam of coal opened out by Messrs. Bingle, White, & Company, at Tighe's Hill, within 3 miles of Newcastle, in the county of Northumberland, and is one of the most important colliery enterprises I have to report in the Newcastle district during the year. A tunnel or adit has been driven into the seam of coal, and a shaft sunk 48 feet in depth, a substantial head gear, screens, 16-horse power engine, and workshops have been erected, and a railway siding to connect the mine with the Waratah line and Great Northern Railway has been constructed. This is the same seam of coal as that worked at the Australian Agricultural, Wallsend, Co-operative, New Lambton, Lambton, and Newcastle Collieries, is of a similar quality, is very free from bands (as the above section shows), and is suitable for steam, household, smelting, gas, blacksmith, and coking purposes.

The specific gravity of the coal averages where proved about 1·27; and this Company having obtained the contract for the supply of coal for the locomotive engines on the Great Northern Railway, the Government tug-boats, steam dredges, and cranes, for the year 1878, it shows that the quality of the coal is equal to any in the district, and the above section shows its great thickness and value. The colliery is situated at a rapidly increasing and important township, known as Tighe's Hill, the property having a frontage to Throsby's Creek and Bullock Island, and the shaft being within 3 miles of the Newcastle Wharf, and about 1½ mile from

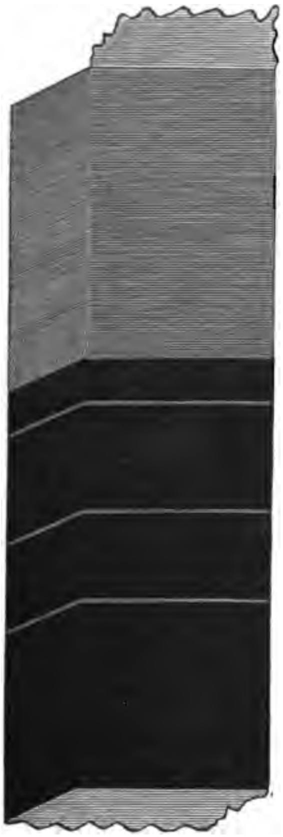
Bullock Island Wharf, where the hydraulic cranes are now at work. Coal from this mine can therefore be shipped either at the Newcastle Government cranes, Bullock Island cranes, or Waratah shoots.

The following certificate has been received by Messrs. Bingle, White, & Company from the Government Officer in charge of the steam dredges:—"I have subjected the Ferndale coal to a thorough test, extending over five days and nights, and the result is of the most satisfactory character. It comprises all the qualities to be desired in a first-class marketable article, having great strength, rapid steam-generating power when thrown into the furnace, burns without stoking until nothing is left but a very moderate percentage of ash. Its enduring strength and entire freedom from clinker will, you will find, ensure for it a foremost position in the classification of our best Australian coals."

The officer in charge of the Government steamer "Ajax" also states:—"Having had a trial of the Ferndale coal, I find it to be free from dirt, with little or no clinker, and throws out a strong heat. I consider it in all respects a first-class steam coal."

The seam of coal was discovered and first opened out by Mr. Bevan, one of the proprietors, and great energy has been displayed by Mr. Harper, the Manager, in bringing the mine into working order since Messrs. Bingle, White, & Company have been connected with it, and I anticipate that a large quantity of coal will be raised from this colliery in the year 1878.

Co-operative Colliery, Newcastle.



	ft.	in.
Sandstone.		
Friable shale, 4 ft. to 6 ft.		
Coal	1	0
Clay band	0	0½
Coal	2	2
Clay band	0	0½
Coal	1	9
Clay band	0	0½
Coal	4	0
Total thickness	9	0½
Grey post.		

This represents a section of the seam of coal now being worked and brought to the surface by an adit or tunnel on the Wentworth estate, by William Laidley, Esquire, the owner of the Co-operative Colliery. As will be seen, the seam of coal is very clean and free from foreign matter, having only three ½-inch clay bands in a thickness of 9 feet and ½ an inch; it lies very flat, dipping only about 1 in 30 to the south. 800 tons per day of round coal are now being raised from this part of the property. It is a continuation of the old Co-operative seam, which is suitable for household, steam, smelting, gas, coking, and blacksmith use, and has gained such a high reputation for steam and gas purposes. It is one of the most important new colliery enterprises I have to report in the Northern district during the year, and great praise is due to Mr. Fletcher (the Colliery Manager) for the energy he has displayed in bringing the mine into working order since Mr. Laidley obtained a lease of the property. It is proposed to connect the colliery by a railway direct from the tunnel mouth with the Great Northern Railway, at a point about 6 miles from the Newcastle harbour.

PORT OF NEWCASTLE AND BULLOCK ISLAND WHARF.

In my last year's Report I referred to the operations then going on at Bullock Island for the shipment of coal, and to the railway having been constructed from the Great Northern Railway, with all the necessary branches therefrom, to four hydraulic cranes, each capable of lifting 15 tons, and shipping 800 to 1,000 tons in twelve hours; and I now have to report that on the 15th ultimo coal was lifted and shipped by one of these cranes, under the supervision of Mr. Darley, and that the facilities for shipment of coal have been steadily proceeded with. Four old cranes have been removed from the Queen's Wharf, and three new ones of largely increased lifting power substituted, and the dredges have been constantly at work deepening the harbour.

The following statistical return, furnished me by Mr. Logan, the Collector of Customs at Newcastle, shows that the greatest yearly increase in the export of coal from this port has been—To Hongkong, 34,322 tons; Victoria, 25,483 tons; China, 11,354 tons; Japan, 10,510 tons; Manilla, 8,665 tons; and coastwise, 12,828 tons; and the greatest yearly decrease—To Petropaulovski, 8,055 tons; South Australia, 7,355 tons; Guam, 5,217 tons; San Francisco, 4,965 tons; Tasmania, 3,574 tons; and New Caledonia, 3,136 tons.

New South Wales—Port of Newcastle—Export of Coal.

To Foreign and Intercolonial Ports.	Tons—1876.	Tons—1877.	Increase.	Decrease.	Total increase for 1877.
Victoria	249,460	274,943	25,483	....	....
New Zealand	146,928	149,363	2,435	....	....
South Australia	87,686	80,331	....	7,355	....
Tasmania	22,280	18,706	....	3,574	....
Queensland	6,064	7,039	975	....	....
Western Australia	....	311	311	....	....
China	11,704	23,058	11,354	....	....
Hongkong	35,273	69,595	34,322	....	....
New Caledonia	4,183	1,047	....	3,136	....
Java	7,204	11,454	4,250	....	....
Japan	3,656	14,166	10,510	....	....
India	21,778	22,830	1,052	....	....
Mauritius	4,311	2,901	....	1,410	....
Manila	4,166	12,831	8,665	....	....
San Francisco	88,522	83,557	....	4,965	....
South America	480	2,865	2,385	....	....
Guam	5,859	642	....	5,217	....
Petropaulovski	10,171	2,116	....	8,055	....
Fiji	260	....	....	260	....
Honolulu	2,868	1,997	....	871	....
Bankok	509	1,000	491	....	....
Padang	3,465	....	....	3,465	....
Portland, O.	2,223	750	....	1,473	....
	719,050	781,502	102,233	39,781	62,452
Coastwise	246,110	258,938	....	....	12,828

DECENNIAL RETURN.

PORT OF NEWCASTLE—Foreign, Intercolonial, and Coastwise Trade.

Year.	Entered inwards from Foreign and Intercolonial Ports.		Cleared Outwards for Foreign and Intercolonial Ports.		Total value of Imports from Foreign and Intercolonial Ports.			Quantity and value of Coal exported to Foreign and Intercolonial Ports.				Total value of Exports (including Coal) to Foreign and Intercolonial Ports.			Total amount of Revenue collected.		
	No. of vessels	Tonnage.	No. of vessels.	Tonnage.				Tons.	Value.								
					£	s.	d.		£	s.	d.	£	s.	d.	£	s.	d.
1868	871	296,517	1,100	372,718	84,486	15	5	480,069	226,440	0	0	283,783	5	0	31,175	9	5
1869	854	297,855	1,084	386,176	151,410	4	5	503,866	223,566	4	2	252,124	3	6	33,058	0	5
1870	765	283,091	1,046	383,242	154,816	5	8	511,545	223,077	7	0	241,435	16	8	32,145	5	7
1871	745	277,959	1,040	376,378	203,168	2	7	489,714	208,833	9	0	236,683	9	3	26,590	1	9
1872	876	342,514	1,092	427,845	268,141	12	11	565,994	243,911	18	0	282,834	9	10	41,196	9	8
1873	978	389,121	1,259	498,468	310,101	11	11	650,899	412,631	5	9	591,032	6	6	48,864	16	8
1874	1,156	510,291	1,269	543,693	343,297	19	11	723,844	496,448	15	0	697,048	7	7	59,387	7	11
1875	1,162	510,902	1,341	573,826	480,771	19	6	771,144	527,949	12	10	644,615	0	6	60,818	4	3
1876	1,023	433,423	1,309	535,738	469,988	2	8	719,050	495,502	0	0	585,114	16	2	54,031	8	0
1877	1,065	469,348	1,328	577,376	502,861	6	4	781,502	540,560	0	0	680,750	11	7	56,584	3	11

N.B.—The quantity of coal shipped coastwise from 1868 to 1877 inclusive was 2,267,059 tons.

BORINGS FOR COAL.

Mr. Gregson, the General Superintendent of the Australian Agricultural Company, has kindly consented to my publishing, for general information, the following account of borings commenced in strata considerably below the Borehole seam of coal, in the neighbourhood of Newcastle, county of Northumberland.

ACCOUNT of strata bored through below the Borehole seam by Mr. Steel, on the Australian Agricultural Company's Platts Estate, near Newcastle.

Name of strata.	Thickness of strata.		Name of strata.	Thickness of strata.	
	ft.	in.		ft.	in.
Surface clay	8	0	Blue slate	3	0
Soft sandstone	8	0	Slate and coal pipes	1	0
Coaly slate	0	6	Hard grey post	0	6
Coal (coarse)	0	4	Blue slate	2	11¼
Hard pipeclay	0	1	Brown slate	0	6
Coal (coarse)	0	1	Shale	0	2¾
Fireclay band	0	1	Coal	0	6¾
Coal (coarse)	1	0	Band of shale	0	4
Parting	0	0¼	Coal	0	6
Coal (coarse)	0	8	Band	0	1
Do. do.	0	5	Coal	0	6¾
Soft grey stone	1	0	Brown shale	0	2
Hard blue slate	0	7¾	Blue slate	0	5½
Pipeclay and slate	7	0	Blue post	0	7
Chert, with bands of pipeclay	1	2¾	Blue slate	0	3¼
Pipeclay and ironstone	2	2¼	Post and slate girdles	1	2¼
Chert	0	6	Grey post	1	6½
Hard pipeclay	3	7¼	Blue slate	0	9¼
Brown coaly slate	0	2½	Grey post	0	6¼
Blue slate	4	0	Ironstone	0	0¾
Slate and coal pipes	0	7	Grey post	0	7¼

ACCOUNT of strata—*continued.*

Name of strata.	Thickness of strata. ft.	in.	Name of strata.	Thickness of strata. ft.	in.
Post and slate girdles	1	0½	Blue slate	43	4
Ironstone	0	0¾	Blue slate with small beds of chert	23	0½
Blue slate	1	6¼	Blue slate	16	0
Brown slate and smut	1	1¼	Post, extremely hard	2	10
Blue slate	9	2¾	Blue slate	24	6¾
Blue post and slate girdles	2	0½	Ironstone	0	3
Blue post	0	6¼	Dark brown slate	48	6½
Blue slate	6	7	Dark slate, with thin beds of blue slate	42	1
Grey post	0	5¾	Blue slate	2	6¼
Blue slate	1	10½	Ironstone	0	3¼
Brown slate	0	9½	Blue slate	27	2¾
Blue slate	9	10¼	Post and slate	5	6
Blue slate and post girdles	2	1¼	Blue slate	5	0¼
Pipeclay and chert	1	0½	Brown coaly slate	1	4
Blue post	0	8½	Soft blue post	0	4
Blue slate	7	3	Ironstone	0	1½
Blue post	1	5	Hard blue post	22	8¼
Blue slate	28	5½	Dark blue slate	9	0
Blue post	0	10	Hard blue post	2	6
Blue slate	5	9½	Coaly slate	2	0
Pipeclay and pebbles	1	10¼	Coal (bright)	0	10¾
Blue post and pebbles	4	11	Post and slate girdles (very hard)	3	8½
Blue slate and post beds	15	10¼	Quartz	0	3¾
White chert rock	0	7¼	Quartzose sandstone	1	9
Blue slate with threads of post	180	10	Slate and post girdles	10	7¾
Grey post	4	7	Post, &c.	10	2½
Grey post and slate girdles	10	6	Quartz and post	5	10
Blue slate	21	4½	Grey post (very hard)	4	11
Very hard post and chert bands	7	0¾	Very hard blue slate, with several bands of ironstone	14	6
Ironstone band	0	1	Slate and ironstone	12	6
Black slate	0	10	Slate, with several beds of ironstone	9	0½
Very hard post and slate girdles	14	2¼	Blue slate	10	8
Ironstone band	0	1	Quartz	0	6
Hard blue post	4	8	Slate and post girdles	4	0¾
Dark brown slate	44	11½	Post	6	2¾
Dark blue slate	21	1¾	Slate and post girdles	2	6½
Pipeclay and chert rock	0	8½			
Blue slate	7	9¾			
Pipeclay and chert	1	3¼		860	0½

And borings still going on.

Alleged encroachment and applications to undermine Reserves, &c.

During the year I have ascertained the extent of one alleged encroachment, and reported upon thirty-five applications to mine for coal under reserves, roads, &c.

PARIS EXHIBITION.

I have procured and forwarded to the Paris Exhibition ten sections of coal, sawn out to illustrate the actual thickness of the various seams of coal worked at the following collieries, viz.:—

Australian Agricultural Company.
Co-operative.
New Lambton.
Newcastle Wallsend.
Newcastle Coal Company's.
Osborne Wallsend.
Bulli.
Illawarra Coal Company's.
Coal Cliff Coal-mining Company's.
Vale of Clwydd.

Considering the short notice the different Colliery Managers had for obtaining and preparing these valuable exhibits, great praise is due for the readiness with which they responded to my request, and the energy displayed in procuring them; and they will no doubt be classed with the most interesting exhibits of colonial productions, and give colliery proprietors, managers, scientific persons, and others, a better knowledge of the great thickness, quality, and value of our seams of coal, than any sections, reports, or diagrams, that could be prepared. It is proposed by the Exhibition Commissioners, at the close of the Exhibition, to present the sections of coal and diagrams accompanying them, prepared by me, to the Jerymy School of Mines, where their exhibition is likely to prove of great benefit to the Colony.

In conclusion, I have only to state that there were thirty-seven collieries under inspection, against twenty-eight in the preceding year, and that I think we have no great reason to complain of the progress made so far in the development of our coal fields.

I have, &c.,
JOHN MACKENZIE, F.G.S.,
Government Examiner of Coal Fields.

In the "Mines and Mineral Statistics, 1875," a table, compiled by the Under Secretary for Mines, was published, showing the quantity and the value of the coal raised during the period 1829 to 1874 inclusive; and in his last annual report the Under Secretary brought the information up to the end of 1876, and gave the average value per ton of coal from 1829 to 1876 inclusive; and I now extend the information to the present time:—

Coal.							
Year.	Tons.	Average price per ton.			Value.		
		£	s.	d.	£	s.	d.
1829	780	0	10	1·23	394	0	0
1830	4,000	0	9	0·00	1,800	0	0
1831	5,000	0	8	0·00	2,000	0	0
1832	6,000	0	7	0·00	2,100	0	0
1833	328	0	7	6·73	124	0	0
1834	8,490	0	8	10·00	3,750	0	0
1835	12,392	0	8	10·19	5,483	0	0
1836	12,646	0	9	1·06	5,747	0	0
1837	16,083	0	9	8·81	7,828	0	0
1838	17,220	0	9	9·05	8,399	0	0
1839	21,283	0	9	9·73	10,441	0	0
1840	30,256	0	10	10·86	16,498	0	0
1841	84,841	0	12	0·00	20,905	0	0
1842	39,900	0	12	0·00	23,940	0	0
1843	25,862	0	12	6·54	16,222	0	0
1844	23,118	0	10	8·34	12,363	0	0
1845	22,324	0	7	10·27	8,769	0	0
1846	38,965	0	7	0·46	13,714	0	0
1847	40,732	0	6	9·01	13,750	0	0
1848	45,447	0	6	3·38	14,275	0	0
1849	48,516	0	6	0·45	14,647	0	0
1850	71,216	0	6	6·77	23,375	0	0
1851	67,610	0	7	6·51	25,546	0	0
1852	67,404	0	10	11·33	36,885	0	0
1853	96,809	0	16	1·51	78,059	0	0
1854	116,642	1	0	5·63	119,380	0	0
1855	137,076	0	12	11·96	89,082	0	0
1856	189,960	0	12	4·96	117,906	0	0
1857	210,434	0	14	0·97	148,158	0	0
1858	216,397	0	14	11·84	162,162	0	0
1859	308,213	0	13	3·14	204,371	0	0
1860	368,862	0	12	3·36	226,493	0	0
1861	342,067	0	12	9·52	218,820	0	0
1862	476,522	0	12	9·73	305,234	0	0
1863	433,889	0	10	10·66	236,230	0	0
1864	549,012	0	9	10·10	270,171	0	0
1865	585,525	0	9	4·43	274,303	0	0
1866	774,238	0	8	4·44	324,049	0	0
1867	770,012	0	8	10·79	342,655	0	0
1868	954,231	0	8	9·08	417,809	0	0
1869	919,774	0	7	6·32	346,146	0	0
1870	868,564	0	7	3·54	316,836	0	0
1871	898,784	0	7	0·47	316,340	0	0
1872	1,012,426	0	7	9·92	396,198	0	0
1873	1,192,862	0	11	1·94	665,747	0	0
1874	1,304,567	0	12	1·37	790,224	0	0
1875	1,329,729	0	12	3·89	819,429	17	2
1876	1,319,918	0	12	2·06	803,300	5	6
1877	1,444,271	0	11	10·74	858,998	8	2
Total	17,481,197	0	10	5·49	9,141,017	10	10

N.B.—From the above we find that the quantity of coal raised in the year 1877 exceeded that of 1867 by 674,259 tons; the year 1867 that of 1857 by 559,578 tons; the year 1857 that of 1847 by 169,702 tons; the year 1847 that of 1837 by 24,649 tons; and that the total quantity of coal raised in the Colony to the 31st December last was 17,481,197 tons, valued at £9,141,017 10s. 10d.

In the "Mines and Mineral Statistics, 1875," a table compiled by the Under Secretary for Mines was published, showing the quantity and value of petroleum oil cannel coal (commonly called kerosene shale); and petroleum oil schist, produced in the years 1865 to 1874 inclusive; and in his last Annual Report the Under Secretary continued the information to the end of 1876 and gave the average price per ton thereof from 1865 to 1876 inclusive; and the following table shows in addition what has been produced during the year 1877 :—

Year.	Tons.	Average price per ton.			Value.		
		£	s.	d.	£	s.	d.
1865	570	4	2	5·47	2,350	0	0
1866	2,770	2	18	10·48	8,154	0	0
1867	4,079	3	14	9·21	15,249	0	
1868	16,952	2	17	7·11	48,816	0	0
1869	7,500	2	10	0	18,750	0	0
1870	8,580	3	4	3·18	27,570	0	0
1871	14,700	2	6	3·91	34,050	0	0
1872	11,040	2	11	11·91	28,700	0	0
1873	17,850	2	16	6·55	50,475	0	0
1874	12,100	2	5	1·48	27,300	0	0
1875	6,197	2	10	2·22	15,500	0	0
1876	15,998	3	0	0	47,994	0	0
1877	18,963	2	9	0·82	46,524	10	0
Total	137,099	2	14	2·21	371,432	10	0

N.B.—The decrease in the average price per ton from 1876 to 1877, is principally caused by the Kembla Oil and Shale Company's Schist Mine (called kerosene shale) being at work in the latter year, and not in the former, and its value being less than the New South Wales Shale Oil Company's mineral.

THE HALF-YEARLY REPORT of the Inspector of Collieries for the half-year ending 31st December, 1877, on the state of the various Collieries in New South Wales, and accidents therein.

The Examiner of Coal Fields, Newcastle.

Sir,

I have the honor, in terms of clause 26 in the Coal Mines Regulation Act, 1876, to transmit to you this my half-yearly report on the state of the collieries under inspection in New South Wales, during the six months ending 31st December, 1877, and my proceedings in connection therewith.

During the first half of the year there were only thirty-one collieries under inspection, viz. :—Northern District, twenty-two mines, two of which have since suspended work, viz., the New Wallsend and Stony Creek mines, and one new mine started, viz., Ferndale Mine, making the present number twenty-one mines. In the Southern District there were four mines, three coal and one shale. Since then two coal mines have been started, viz., the Coal Cliff and North Bulli mines, making the present number six mines. In the Western District there were five mines, four coal and one shale mines. Since then one coal mine has been started, viz., Mr. A. Brown's Cooerwull Mine, making the present number six mines. In the South-western or Berrima District, the Nattai and Cataract River, two coal mines have been re-opened, and two kerosene-shale mines started at Joadja Creek, making four mines.

During the term embraced by this report there were under inspection in the—

Northern District	21	coal mines.			
Southern „	5	„	and	1	shale mine.
Western „	5	„	„	1	„
South-western District	2	„	„	2	„
	33	„	„	4	= 37 mines.

During the present six months I have inspected the mines in each district twice round, and about one-fourth of them three times, which is once about every twelve weeks, instead of every eight weeks as required by clause 24 in the Coal Fields Act of 1876.

PRESENT STATE OF THE MINES.

A. A. Company.—Considerable improvement is now made in the ventilation of the mine, and when the new ventilating fan which is being erected is fully going, a still greater improvement is expected. The average quantity of fresh air introduced into the mine during the six months is about 50,000 cubic feet per minute, which is rather below the minimum quantity required by the Act for about 600 men and horses employed in the mine. The Act is carried out in other respects.

N. C. M. Co.'s.—About 45,000 cubic feet of air per minute is introduced into the mine for about 200 men and horses employed therein, which is over double the minimum quantity required by the Act. No cause of complaint.

Waratah.—The number of miners employed is now reduced to about thirty; only four places working. Coal nearly exhausted. No complaints.

Lambton.—The average quantity of air introduced into the mine during the six months is about 120,000 cubic feet per minute for about 400 men and horses employed therein, which is about three times the minimum quantity required by the Act. In other respects the Act is complied with also.

New Lambton.—About 31,000 cubic feet of air per minute is introduced into the mine for about 300 men and horses employed therein. The Act is carried out in other respects also.

Goose Colliery.—Only one or two men employed in the mine, getting house coal mostly. No complaints.

Wallsend.—The average quantity of air introduced into the mines during the six months is, for B pit, about 75,000 cubic feet per minute for about 320 men and horses employed therein, and for the new tunnel about 15,000 cubic feet per minute for about 140 men and horses employed. It will be seen that the B pit is supplied with over double the minimum quantity of air required by the Act, and the new tunnel's supply is slightly over the minimum. The Act is carried out in other respects also.

Co-operative.—About 20,000 cubic feet per minute of air is introduced into the old tunnel for about 100 men and horses employed, and about 24,000 cubic feet per minute into the new tunnel for about 250 men and horses employed therein. The former is supplied with double the minimum quantity required by the Act, while the latter tunnel is rather below such requirement. I have called the Manager's attention to the necessity for securing a fly-wheel of the new tunnel engine; and also for placing a drag behind the full coal sets coming up the incline plane to prevent them running back, in case of the rope breaking, &c.

Duckenfield.—The average quantity of air introduced into the mine during the six months is about 28,000 cubic feet per minute, which is rather over the minimum quantity required by the Act for about 240 men and horses employed therein. The Act is otherwise carried out also.

Brown's Colliery.—About 10,000 cubic feet of air per minute is introduced into the mine for about sixty men and horses employed therein. The colliery is still in course of developing only. No complaints.

Alenwick.—Mr. Daniel Williams is now the owner of the colliery. Little or no coal sent into market during the six months.

Nott and Ward Pit.—Only three men employed, getting house coal on their own account. No complaint.

Tulip's Pit.—Only three men working, getting house coal on their own account. No complaint.

Inganee Pit.—All the men were lately removed from the old tunnel and the new pit into the pit known as Dixon's pit. About thirteen men are employed. The air current not being strong enough to move the anemometer, I am therefore unable to give the quantity of air in the mine. The workings are rather short of air at present, but I expect an improvement when the old airways are reopened, &c., which will be effected in making a second opening to the day, as promised by Mr. Mitchell at once, through which the men might pass, &c.

Bloomfield.—The lessee only employs one man with himself in the mine. No complaint.

Anvil Creek.—The average quantity of air introduced into the mine is about 9,000 cubic feet per minute, which is over the minimum quantity required by the Act for about sixty men and horses employed therein. Unfortunately the working of the colliery has been greatly interrupted lately owing to fire having occurred in the mine, and the men employed to extinguish the same have necessarily and voluntarily suffered considerable hardship whilst so employed.

Greta Pits.—Air abundant in the old pit, where the number of miners is greatly reduced. However, the air in the new pit is much less than the minimum quantity required by the Act, being only about 2,000 cubic feet per minute for about fifty men and horses employed. I have called the attention of the manager to the deficiency, and he promised to do all he could to improve the same, by connecting both pits, and drives are pushed on for that purpose. No other complaint.

Rix's Creek.—Only the lessee at work. Doing very little.

Raspberry Gully.—Working very slowly. However, about 30,000 cubic feet of air per minute was introduced into mine the last time I measured it, for about 150 men and horses employed. No complaint.

Australasia.—Only a cargo or two of coal sent to market and suspended work again.

Ferndale.—Busily engaged fitting up winding machinery and gear, and making a branch line of railway.

Bulli.—The average quantity of air introduced into the mine during the six months is about 23,000 cubic feet per minute, which is considerably more than the minimum required by the Act for about 150 men and horses employed therein. The miners are now paid by weight for the coal they get. The Act is carried out in other respects also.

Osborne Wallsend.—About 12,000 cubic feet of air per minute is introduced into the mine for about eighty men and horses employed therein, which is considerably more than the minimum quantity required by the Act. The miners are not yet paid by weight for the coal they get. The Act is carried out in other respects.

Mount Pleasant.—The average quantity of air introduced into the mine is about 7,000 cubic feet per minute, which is rather below the minimum quantity required by the Act for about eighty-eight men and horses employed therein. However the manager has promised to take steps for increasing the quantity. The miners are not yet paid by weight for the coal they get. In other respects the Act is complied with.

Mount Kembla—Shale and Coal.—About twelve miners are employed in the shale mine and one in the coal mine. The air currents are not measurable by the anemometer, therefore I cannot give the quantity of air passing through the mine. However both mines are in a fair state. All the miners work on wages. The Act is carried out in other respects.

Coal Cliff.—Preliminary works nearly finished, and will be ready for shipping coal shortly. No complaints.

North Bulli.—A few miners still employed exploring for a good workable coal seam.

Vale of Clwydd.—About 13,000 cubic feet of air per minute is introduced into the mine for about twenty men, &c., employed therein, which greatly exceeds the minimum quantity required by the Act. The miners are not yet paid by weight for the coal they get. Otherwise the Act is carried out.

Esk Bank.—About 7,000 cubic feet of air per minute is introduced into the mine for about sixteen men, &c., employed therein, which greatly exceeds the minimum quantity required by the Act. The miners are not yet paid by weight for the coal they get. Otherwise the Act is complied with.

Lithgow Valley.—About 6,000 cubic feet per minute of air is introduced into the mine, which is double the minimum quantity required by the Act for about thirty men, &c., employed therein. Otherwise the Act is carried out also.

Bowenfels.—About ten men, &c., are employed in the mine, but the large size of the airways renders it difficult to measure the quantity of air introduced into the mine, which however is quite sufficient for all purposes. The miners are not yet paid by weight for the coal they get. Otherwise the Act is carried out.

Mr. A. Brown's Mine.—Only one man employed about half-time getting coal for the engine of the tweed factory. No complaint.

Hartley Shale.—Nearly all the miners have been removed from the old tunnel into the new one, where about thirty miners are now employed. The ventilating arrangements being incomplete, &c., the air-current in the mine could not be taken with the anemometer. However, the workings are comparatively fresh, &c. The Act is complied with in other respects.

Fitz Roy.—Although the lessees of the works started to get coal both at Nattai and at the Cataract River mines, they found the working expenses so great that they again stopped the Cataract Mine, but they still get a little coal at Nattai. No complaint.

Lamb & Co. Shale Mine.—Doing very little at present in the mine. Busy constructing tramway, &c.

Carter's Shale Mine.—Only two miners employed in the mine as yet. No complaints.

Accidents in the Mines.

It is satisfactory to be able to state that all the colliery managers continue to supply the miners with all necessary means wherewith to secure their working places, which fact must in some measure account for the present light list of accidents in the mines of, as I believe, only nine separate accidents to a similar number of persons, and consisting of two fatal and seven non-fatal cases. However, as I investigated only six of the non-fatal cases, I proceed to give them only. Two of them happened in the Bulli Colliery, one in Brown's Colliery, one in the New

Lambton Colliery, one in the Duckenfield Colliery, and one in the Wallsend Colliery. Of the two accidents at Bulli one was a leg fracture by being jammed between the full skips and the side on the engine plane; the other was a serious injury to the back and spine by a fall of stone. The one in Brown's Colliery was both the thighs fractured by a fall of coal. The one in New Lambton was severe bruises on back and bowels by being jammed between the full set of coal skips and side on the horse road. The one in Duckenfield, a leg fracture by a fall of coal; and the one at Wallsend, arm fracture and bruises by a fall of coal. I have investigated several minor accidents during the six months also.

A tabulated list of all the serious accidents investigated by me is hereto annexed.

I believe that the Examiner of Coal Fields investigated all the other accidents during my absence from the district inspecting the collieries in the other districts.

THOMAS LEWIS,
Inspector of Collieries.

TABULATED LIST of fatal and non-fatal Accidents in New South Wales Collieries during the six months ending 31st December, 1877.

No.	Date.	Colliery.	Sufferer.	Occupation.	Remarks on nature and extent of injuries.	Non-fatal.			Total Non-fatal.
						Falls of coal.	Fall of stone.	Other causes	
1	July 19	Bulli	John Dalley	Miner......	Leg-fracture by being jammed between skips and side of engine plain.	..	...	1	1
2	Aug. 3	Brown's Colliery	Samuel Waugh ...	do.	Fracture of both thighs by a fall of coal.	1	...	...	1
3	Sept. 25	New Lambton ...	Joshua Morgan ...	Wheeler..	Severely crushed on back and bowels between skips and side	...	...	1	1
4	Oct. 8	Duckenfield	David Morgan	Miner......	Leg-fracture by a fall of coal.	1	...	...	1
5	Nov. 12	Bulli	Thomas Loveday...	Roadman.	Back and spine injured by a fall of stone.	...	1	...	1
6	,, 20	Wallsend	Thomal Llywelyn..	Miner......	Arm-fracture, &c., by a fall of coal.	1	...	...	1
					Totals..............................	3	1	2	6

GEOLOGICAL SURVEYOR'S REPORT.

REPORT OF PROGRESS OF THE GEOLOGICAL SURVEY, DURING THE YEAR 1877.

To the Under Secretary for Mines, &c., &c.

Sir,

During the past year (1877) the Geological Survey staff has been engaged upon the geological examination of gold fields, reserves, and coal lands, water supply to Grenfell and Gulgong, besides other matters connected with the mining interests.

By direction of the Hon. the Minister for Mines, in January I inspected certain coal lands at Teralba, Lake Macquarie, and Anvil Creek. My reports thereon you have already received, it is therefore unnecessary for me to make further reference to them here. I may, however, draw attention to a thick seam of coal which, as far as I am aware, has not hitherto been described. This coal seam crops out on the side of a steep range, about 280 feet (aneroid observation) above sea level, in Mr. Samuel Holmes's property near the Sugarloaf Mountain, and extends into the adjoining coal lands of Messrs. Garrett and Greville, at Teralba. The following is a section of this seam where it has been partly opened on Mr. Holmes's ground :—

65 feet	Conglomerates, at the base of which are thin bedded sandy shales containing nodules of clay ironstone.
4 feet 0 inches	Coal
0 „ 1 „	Band
4 „ 0 „	Coal
0 „ 3 „	Band
0 „ 8 „	Coal
0 „ 0½ „	Band
2 „ 4 „	Coal
5 „ 0 „	Coal, with two thin partings not very distinctly seen on the outcrop, this part not having been opened.
16 feet 4½ inches.	

The coal appears to be of excellent quality, and consists of splint, with layers of bright bituminous coal. Above it occurs a thick mass of pebble conglomerates; similar conglomerates are seen capping the hills between this place and Lake Macquarie, where also coal outcrops from immediately under the conglomerates in two places; one outcrop is in the bed of a gully near the north-east corner of portion 12 in the parish of Teralba, and the other is about 2 miles to the south-east from this point on coal lands leased by Mr. R. D. Adams, but the thickness of the coal seam was not visible, owing to the thick covering of surface débris. It is, I believe, the same seam as that on Mr. Holmes's land, seeing that it occupies the same horizon in reference to the conglomerate beds. There is also an outcrop of coal on the west side of Diegga Flat. The conglomerates have an irregular but general dip towards the south-east, and form some of the cliffs on the north-western shores of Lake Macquarie.

It is important to observe that under the area covered by these conglomerates in this locality all the various coal seams of the Newcastle Coal Field are likely to be found. It is probable that the above-mentioned thick seam of coal is the topmost seam of the Newcastle coal measures; its relative position is from 450 to 500 feet above the main seam worked at the

Minmi, Wallsend, and other collieries, and it may be the equivalent of the seam at Burwood, which is described as the top seam by the Examiner of Coal Fields (see No. 1 on section No. 7, Mines and Mineral Statistics, 1875).

According to your instructions I inspected the North Bulli Coal-mining Company's land. Here the seam of coal, which is a continuation of the Bulli seam, crops out on the side of the mountain facing the ocean at an elevation of 270 feet above sea level. In an adit which has been driven into the seam along its dip in a north-westerly direction, the coal is seen to be 3 feet thick, and to have been intruded by a basaltic dyke. The basalt has been forced laterally through the seam, and the coal has been baked into hard coke for more than two (2) feet from the basalt rock. Three sections measured in the different places in the adit shows thus:—

No. 1.	Sandstone (roof).	No. 2.	No. 3.
0 ft. 6 in.	semi-bituminous coal	0 ft 3 in.	2 ft. 0 in.
2 „ 3 „	coke	2 „ 6 „	0 „ 9 „
1 „ 8 „	basalt (decomposed)...........	2 „ 2 „	0 „ 3 „
0 „ 2 „	coke	0 „ 2 „	0 „ 2 „
	Fireclay		
2 ft. 11 in.	coal and coke	2 ft. 11 in.	2 ft. 11 in.

The course of the dyke is not apparent at the surface, but it is probably a few degrees to the north of west, which is the same as that of two other similar dykes seen on the coast in the vicinity. If so, the adit, when driven about 200 yards further, will have passed through the dyke and come into the unaltered coal. The smallness of the seam, only 2 feet 11 inches thick, is not due to the intrusion of the basalt, but to a "roll" in the floor of the seam, or in other words, to the unevenness of the stratum on which the vegetable matter forming the coal accumulated. Consequently, without actually prospecting it would be impossible to say how far the "roll" extends. Rolls occur in other collieries in this coal field, the coal thinning out to about half its usual thickness; but these rolls extending only for several yards are of minor importance.

Short borings put down on the side of the mountain, from levels above that of the outcrop of the seam, would test the thickness of the coal near the surface.

On Westmacott's land, a short distance to the south, the seam is 5 feet thick; and to the north, at the Coal Cliff Line it is 6 feet thick of marketable coal. At Coal Cliff Mine there is perhaps the finest cliff section of coal strata that can be seen on the coast. We have here a thickness of about 600 feet of shales, sandstones, and conglomerates, resting on the main coal seam, which crops out just above high-water-mark, and extends like a broad black line along the base of the cliff. Several other seams of coal crop out on the North Bulli Company's estate, none of which have yet been opened; three of them show very conspicuously in the cliff sections along the coast. The following is a section of the cliff near Long Point:—

20 feet 0 inches,	brown sandstones and shales.
0 „ 9 „	coal (inferior).
0 „ 9 „	clay band.
2 „ 8 „	coal splint with seams of bright bituminous coal.
0 „ 6 „	shales.
1 „ 5 „	coal (stony).
0 „ 8 „	shale.
2 „ 6 „	coal, bituminous and splint, with one ¼ inch parting.
6 „ 6 „	fireclay shales.
1 „ 4 „	hard calcareous sandstone.
18 „ 5 „	ferruginous and calcareous shale and sandstone (sea level).

In conjunction with Mr. W. H. J. Slee, Inspector of Mines, I examined the Great Victoria Gold-mining Company's quartz reef at Adelong, for the purpose of reporting upon the merits of that Company's claim for the Government reward of £1,000, for having been the first to discover and make known to the Minister for Mines the existence of payable gold-bearing quartz at a depth of 800 feet perpendicular from the cap of the reef.

Under our supervision 3 tons of quartz were raised from a depth of from 810 to 820 feet; the result of the crushing, which was carefully conducted at the Royal Mint, gave at the rate of 1 oz. 12 dwts. 12·9 grs. of standard gold, and 1 dwt. 18 grs. of standard silver (value together, £6 7s. 0½d.) per ton of quartz. Two samples of the tailings from this crushing were assayed at the Mint and found to contain only 4 dwts. 10 grs. of gold and 1 oz. 13 dwts. 1 gr. of silver per ton of tailings. The quartz contained much iron pyrites.

The Company's property consists of two adjoining leases, situated on the Victoria reef, about half-a-mile north from the town of Adelong. The leases together embrace 334 feet along the line of the reef; the bearing of the reef is N. 10° W., its general dip is easterly, but it varies thus,—for the first 110 feet it is easterly, then to the 400 feet level the dip changes slightly to the west, again it turns to the east for 130 feet deeper, and then westerly, but almost vertical to the 820 feet level.

The reef occurs in a dark greenish schist, which varies in width from about 2 to 10 feet, and is bounded on both sides by well defined walls of hard quartzose granite containing black mica. The quartz reef is sometimes over 12 inches thick, at others it makes into several veins accompanied by numerous thin thread-like veins of gold-bearing quartz interlaminated with the schist, so that in places nearly the whole width of the schist or "channel" of the reef is taken out for crushing. Such is the general character of the veinstuff from the surface down to the lowest level. Both the schist and the quartz are highly impregnated with pyrites. Occasionally "horses" of granite make into the schist; they may be well seen in section in the face of a drive near the 730 feet level.

Characteristic samples of the reef and of the rocks associated with it were obtained by the Inspector of Mines and myself for the Museum of Mines. At the 820 feet level the reef is 11 inches thick, and widening as it goes down it shows gold freely. The schist here is full of thin veins of quartz (called "seconds") containing pyrites and gold; sometimes veins of calcite are met with. The mine is remarkably dry; the only water entering it is that which drains in from the upper levels near the surface.

The Mining Manager informed me that the offering of the £1,000 reward by the Government induced him to push forward the sinking of the main shaft, with the hope of enabling the Company to merit the reward. Other Mining Companies were also, I believe, sinking with the same object in view. It is thus gratifying to know that the intention of the Government in offering this reward has been so quickly realized; and the good effect thereof, while directly benefiting an individual Company, will be to establish confidence in the permanency of quartz-mining in the Adelong Gold Field, and probably in other gold fields throughout the Colony.

I availed myself of the opportunity to ascertain the temperature at various depths in this deep mine. Both in descending and ascending the mine the thermometer read as follows:—

Depth, 200 feet, 60°
„ 400 „ 60°
„ 450 „ 60°
„ 510 „ 60°
„ 620 „ 65°
„ 730 „ 68°
„ 815 „ 70°

Above the 510 feet level the temperature was affected by the currents of air circulating through the mine. Below that level we find an average rate of increase in temperature of about 1° for every 30 feet, but this rate apparently diminishes with the depth. The weather at the time these observations were taken was rather warm; at the surface the temperature in the shade was 75°.

On the 5th March, Signor D'Albertis kindly showed me his collection of natural history objects from the Fly River in New Guinea. Amongt them were stone implements formed from diorite, sandstone, and basalt; fragments of fossils, ammonites, teeth of charcharodon, pecten, recent corals, &c., and black shale, indicating the occurrence in that part of New Guinea of basalts, cretaceous and miocene beds, diorites, silurian, and probably carboniferous strata, and that with the silurian and diorite formation we may suspect the existence of gold deposits.

Water supply to some of the principal gold fields is becoming a matter of pressing importance. I made an examination of the country around Grenfell for the purpose of ascertaining the best means of providing a water supply for that town. It was suggested in the petition from some of the residents of Grenfell to the Minister for Mines that the broken dam, known as the Company's Dam, might at a comparatively small cost be repaired and rendered available for a permanent supply; but I found that this dam was only at a sufficient elevation for water to be conveyed by gravitation to the lower part of the town; and as it was considered advisable to avoid a pumping scheme, if one by gravitation could be obtained, I examined the most suitable localities, which are three valleys draining the southern slopes of the Warradery Range on the north side of Grenfell. The Star Gully affords the best site for a dam at a sufficient elevation. The capacity of the dam would be 8,217,000 gallons, and from it a 4-inch pipe could deliver 59,000 gallons per day to the highest part of the town; but it is probable that not more than half that quantity per day will be required for some years hence. One-third of the least annual rainfall over the catchment area is 42,527,000 gallons, so that there can be no doubt regarding the permanency of the supply. The estimated cost of this scheme, including construction of dam, 120 chains of 4-inch cast-iron pipes and laying same, &c. (of which particulars are given in my report), is under £2,000. I therefore recommended the appropriation of that amount for carrying out this much needed work.

On my return from Grenfell after inspecting and reporting on some reserved auriferous lands at Demondrille and Murrumburrah, I proceeded according to instructions to examine a portion of the Bulli Coal-mining Company's property, in order to ascertain the most favourable spot for boring in search of that part of the coal seam which had been displaced by a down-throw fault. I have since been informed that the seam has been found by the Mining Manager, Mr. A. Ross, near the place indicated by me, though a few feet nearer the surface than I had anticipated. It has however been cut off again, but whether in this case by another fault or merely by denudation I have not heard.

I was also directed to examine the coal land belonging to Mrs. Aitcheson at Mount Kembla, which includes not only the main seam of coal worked at Bulli, Mt. Pleasant, and Mt. Kiera collieries, but all the other seams known to occur in the coal measures in this locality, and which may be seen cropping out on the property of the American Creek Coal and Shale Company.

The question of water supply to Gulgong was referred to me. On examination of Cooyal Creek Valley it was found that suitable sites for reservoirs at a sufficient elevation above Gulgong would be at such a distance from that town as to involve too great a cost for the carrying out of a gravitation scheme. Mr. T. A. Browne, P.M., Warden, Mr. C. Bottom, District Surveyor, and Mr. E. A. Nardin, Road Inspector, have advocated the pumping of water from certain shafts near Gulgong; but for reasons given in my report, I recommended the Cudgegong River as the source of supply. This river at Guntawang is about 3¾ miles from Gulgong, and 240 feet (by aneroid) below the highest part of the town. This scheme, which would be capable of supplying over 300,000 gallons per day for household and domestic purposes, is estimated to cost about £6,000.

I examined and reported upon the Gilmandyke Creek Gold Field, recommending the lands reserved therein to be thrown open to conditional purchase under section 14 of the Crown Lands Alienation Act, 1861; some of this land is of good quality for agriculture, and will be quickly taken up by selectors. The old Gilmandyke diggings were limited to a small area, where the denudation of auriferous reefs near the junction of silurian schists with greenstone dolerite had furnished the gold to the pleistocene deposits forming the alluvial flats along the course of the creek. On this locality there are other outcrops of greenstone, in one of which, on the Summer Hill estate, are quartz veins containing sulphurets of copper; but I doubt if this ore occurs in sufficient quantity to be profitably worked for copper. I am of opinion, however, that in this rock payable auriferous vein-stuff may exist, and this belief is supported by the occurrence of gold-bearing gravels which have been worked on the banks of the creek, just below where this greenstone has been denuded. In the more recent alluvial flats through which the creek flows, there is probably a run of payable gold-bearing drift. In the silurian rocks forming the adjacent hills, talcose schist occurs; it is of excellent quality for firestones for furnaces.

Near the Gilmandyke diggings the greenstone is traversed by two remarkable dykes of white elvanite containing iron pyrites; one near Mount Lawson strikes north-west and is 50 feet wide. Between Mount Lawson and Wallbrook are massive beds of marble limestone full of fossils—favosites, encrinites, streptorhynchus, &c.; the same description of limestones may be seen in several places near Rockley.

At Dunn's Plains Pepper's Creek flows through country occupied by hornblendic granite and talcose schists, with patches of tertiary quartz-pebble drift, which latter in places is likely to contain gold deposits; but the land is private property, and therefore not open to prospectors.

On the Church and School lands to the south of the Cow Flats and Apsley Copper Mines, I inspected and reported upon the lapsed mineral leases. On some of these near the Back Creek gold diggings several quartz reefs occur, traversing (strike N. 25° W.) silurian talcose schists, and more or less charged with copper carbonates and sulphurets, and specular and brown oxide of iron. These reefs are doubtless auriferous, for the alluvial deposits in the neighbouring creeks have been and are still being worked for gold.

The general formation of the Cow Flat district consists of silurian sandstones, shales, limestones, and talcose, chloritic, and micaceous schists, traversed by numerous quartz reefs, some of which are of great thickness, and termed by the miners "blows." The general strike of both the strata and reefs is N. 25° W., dip easterly, though near Bath Creek they strike N. 30° E., and dip westerly. Copper ore occurs in many of the reefs. The ore usually forms in irregular bunches with the quartz, and sometimes the quartz runs out, and copper ores alone occupy the vein fissure; but more frequently the reverse of this is the case. The green and blue carbonates of copper ore are generally found near to the surface, and passing downwards the black oxide or "coated ore" is met with, and below this grey and yellow sulphurets with galena; occasionally the red oxide, and also a little native copper are found. The irregular and uncertain mode of distribution of the ores is the chief cause of so much fluctuation in the copper-mining industry of this district.

From Rockley I proceeded to inspect the Oberon, Native Dog, and Campbell River Gold Fields, for the purpose of ascertaining what portions of the reserved areas might be thrown open for selection without detriment to mining interests; my report, and plan indicating these areas, you have received.

During my examination of the gold fields, I also sketched in approximately the general geological features, which are shown on the accompanying plan. This country occupies the western portion of the county of Westmoreland, and is nearly surrounded by the Fish River and Campbell River. These streams, which are the two principal tributaries to the Macquarie River, take their rise within a few miles from each other in the Great Dividing Range, about 37 miles in a south-easterly direction from Bathurst. The Fish River flows first in a northerly course, and then westerly, whilst the Campbell River takes a westerly direction for about 8 miles, and then northerly till it joins the former, and the two streams now united form the Macquarie River, on which, 6 miles below their confluence, is situated the city of Bathurst. The area thus almost encircled by these rivers embraces about 419 square miles of undulating and mountainous country, varying in elevation from 2,200 feet to 4,000 feet above sea-level. It comprises some rich as well as some worthless land for agricultural and pastoral purposes, while the extensive range of country open for future mining enterprise is indicated by the payable auriferous alluvial deposits in many of the valleys, and the frequent occurrence of both copper- and gold-bearing reefs in the hills.

The two principal formations of this district are upper silurian schists and granite, covered in places with tertiary gravels and basalt. The former, together with some intrusive masses of serpentine and diorite, occupies the southern and more elevated parts of the district. The granite, which is hornblendic and occasionally porphyritic, can be traced along the Fish River valley for a distance of 35 miles from the Campbell River junction; it is part of the same granitic mass which has given rise to those undulating and fertile plains which impart such a marked and picturesque feature to the scenery surrounding the city of Bathurst. There is also a considerable extent of hornblendic granite immediately to the south of Oberon. A gold-bearing vein, known as Blackman's Reef, traverses this granite, and strikes N. 70° E., with an underlay towards the south. This reef has been worked down to the water-level and then abandoned; but I am informed that it is about to be opened again by Mr. Davis, an energetic quartz-miner in the Oberon Gold Field. This is the only gold-bearing vein that has yet been worked in the granite formation of this locality; but it is probable that others exist in the same rock, seeing that the hornblendic granites in this Colony (as was first pointed out by the Rev. W. B. Clarke, M.A., F.R.S.) are usually of an auriferous character.

In the very micaceous granite near Slippery Creek occurs a quartz reef from 6 to 18 inches thick, which has been opened to a depth of 6 feet, but not properly tested; it contains a large amount of arsenical pyrites, a sample of which that I collected gave an assay at the rate of 2 ozs. 7 dwts. 10 grs. of gold, and 19 dwts. 19 grs. of silver per ton.

Near Kirk's Farm, on the Fish River, some land was taken up, supposed to contain tin and copper ores, and on it a considerable amount of fruitless prospecting has been done. I found here, at the junction of the granite and altered silurian rocks, a mass of crystalline limestone about 5 chains wide, traversed by several narrow dykes of augitic basalt. The limestone is partly surrounded by an irregular coating, so to speak—in places 50 feet thick—of garnet rock, composed almost entirely of dark brown opaque crystals of garnet in dodecahedral and trapezohedral forms, and with which I found large prismatic green crystals of epidote. This garnet rock much resembles some tin ores, but the crystalline form, as well as the greater specific gravity of the latter, are at once distinguishing tests. In the adjoining altered schist are large masses of a white, fibrous, crystalline rock, consisting of silicate of lime (Wollastonite), in which are embedded some large black crystals of garnet. Almost everywhere this granite contains enclosed pieces of mica schist and quartz; it is evidently of an intrusive character.

On Diamond Hill, near Sidmouth Valley, at the junction of granite and diorite with altered silurian schists, we find a similar occurrence of Wollastonite with garnet rock, in association with epidote, specular and brown iron ore, and black oxide of manganese. There are here also several reefs of very crystalline quartz containing semi-transparent garnets and sulphurets and carbonates of copper. In one of the reefs in diorite, near the summit of Diamond Hill, it is said that gold in quartz was discovered in 1823. Mr. J. Willard Lowe, of Sidmouth Valley, informed me that in that year, in his presence, his father, Mr. Robert Lowe, and Lieutenant W. Lawson, while collecting some specimens of quartz crystals from the reef, found one specimen of quartz containing a piece of gold of the size of a pea; to make sure that it was gold, these gentlemen are said to have had the specimen tested. It is also interesting to observe that on the Fish River, about 2½ miles north from this spot, Mr. Assistant Surveyor M'Brien, when engaged on the survey of the river, on the 15th of February, 1823, stated that he discovered gold. The following is the entry bearing that date in Mr. M'Brien's field book: "At this place I found numerous particles of gold in the sand in the hills convenient to the river."

It is therefore the earliest notice on record of the discovery of gold in Australia; and the next is that made in the year 1841, near Hartley, by the Revd. W. B. Clarke, to whose geological explorations the commencement of the vast gold-mining industry in the Australian Colonies is chiefly to be attributed.

The Silurian formation consists of sandstones, conglomerates, shales, slates, and limestones. These rocks contain encrinites, favosites, spiriferæ, rhynchonella, petra, &c. There are numerous quartz reefs, several of which have been found gold-bearing and have been worked; amongst them may be mentioned Davis and Lambert's, the Faugh-a-ballah, Malloy's, and the Lucks-all reefs, besides others, all of which are now abandoned, but some of them are said to have yielded up to 1½ oz. of gold per ton from crushings of several hundred tons. In Davis and Lambert's reef a very rich shoot of quartz was worked from the surface downwards for a few feet, when it was suddenly cut off by a bar of rock; further prospecting failed to prove its continuance. In the same locality may be seen other quartz reefs outcropping at the surface, and while these remain untested, though a few of them have been prospected a little at the surface, it is impossible to believe that the only auriferous reefs are those that have been opened. Considering the adverse circumstances under which some of these abandoned reefs have been worked, as regards the distance of cartage over hilly country to the crushing-machine, if the reported yields from the crushings be true, as I have reason to believe them to be, I have little doubt but that with careful management in working the reefs would prove payable.

Near Oberon, on the estate of Mr. Charles Whalan, are some reefs traversing hornblendic and chloritic schists, and diorite. These rocks at the surface are much stained with red oxide of iron, resulting from the decomposition of the mundic, or iron pyrites, which the unweathered portions of the rocks abundantly contain.

Crosier's reef, near the Swallows' Nest Diggings, occurs in soft slate, and strikes north and south, and dips at an angle about 45° to the east; it is 6 inches thick on the outcrop, and is said to vary from 4 inches to 7 feet in thickness, being 2 feet thick at the greatest depth worked, viz., 200 feet, where, I am informed, the quartz yielded 1 oz. to the ton. The yield varies from 3 dwts. per ton where the reef is 7 feet thick, up to 3 oz. 16 dwts. per ton at the 20 feet level, where it is 10 inches thick. The reef has been traced at the surface for a length of about 30 chains. Messrs. Crosier and Son have leased a portion of the reef, and are working it on a small scale. The rest of the claims on it are said to have been abandoned when the rush to Trunkey Creek took place a few years back. I am of opinion, however, that this is a reef worthy of attention. Some rich alluvial ground has been worked just below where a gully crosses the reef, and on some of the higher ground near the cap of the reef is an ironstone cement containing gold. There are probably other gold-bearing reefs in this locality.

Between Wiseman's Creek and O'Connell's is the Breakfast reef, on which several deep shafts have been sunk; it occurs on a range formed of beds of mica schist, conglomerate, and hard altered sandstone. The reef strikes N. 30° W., and consists of long patches of purple-coloured quartzite with irregular veins of quartz. It contains iron pyrites, specular iron, green chlorite, and yellow starry, and green mica. The reef is now abandoned, and therefore I could not get particulars regarding the working of it, but I am informed that some rich gold specimens were obtained from it near the surface.

Much alluvial gold-mining has been carried on along the courses of the rivers, and in many of the creeks and gullies. The deposits of gravel (pleistocene and recent) forming the banks of the Fish or Duckmaloi River, both above and below where the Binda and Oberon Road crosses it, have been considerably worked by miners, and in places will still afford a "poor man's diggings" for some time to come. On Campbell River, and on Sewell's and Wiseman's Creeks, the same gravels have been extensively worked during the past fifteen years, and there are still parties, chiefly Chinese, ground-sluicing the banks by means of water brought by races from dams higher up the stream. The drifts in the bed of the Campbell River, and of the other streams, have in many places not yet been worked out, and there can be no doubt as to the large amount of precious metal therein deposited; but hitherto the wet nature of the gravels, and the occasional floods after storms, have proved the working of them a matter of difficulty, excepting in dry seasons. I have, however, recommended that such lands should not yet be alienated from the Crown; for with cheaper labour and more economical methods of saving the gold than we at present possess, these river beds will afford remunerative employment for many gold-miners in the future.

Near the head of Native Dog Creek, which is an easterly branch of Sewell's or Stony Creek, there are some shallow alluvial diggings, which at one time proved very rich, and on which a few miners are still at work. The occurrence of the gold here is peculiar. The bed-rock consists of silurian shales and conglomerates, with a mass of serpentine forming the rising ground on the west. The silurian rocks are traversed by a few pyritous quartz veins, and also by a dyke of quartz porphyry 40 feet wide, having a meridional strike. The alluvial débris was rich near this dyke, and also on the slopes of the hills as far up as the boundary of the schist and serpentine, but above this the gold ceased to be found in payable quantities. With the gold, blue and green sapphires and red zircons are plentiful. Some good samples of these gem-stones were given me by Mr. T. Williams for the Museum of Mines. The gold is angular, and not much waterworn, and has evidently not been carried far from the veins and rocks from which it has been derived. About 6 miles from here in a north-westerly direction there is another similar diggings, where in the shallow alluvial near the junction of the silurian schists and serpentine rich deposits of gold have been obtained. In the schists, which are very talcose, some thin veins of gold-bearing quartz have been struck, but I am inclined to believe that the gold found in the alluvial had not only been derived originally from the quartz veins, but also from the talc schists near their junction with the serpentine; for amongst the gold washed out of the soil resting on the schists I found several particles of gold with schist attached. It is very probable, therefore, that further search will discover some of the schist profitable to work.

This may also serve to explain the peculiar occurrence of gold at the above-mentioned Native Dog diggings, where some of the heaviest gold was obtained on the schists close to their junction with the serpentine. These localities I have included within the area recommended to be reserved from sale, for in them I believe that payable reefs will be discovered.

Not less important than the recent and pleistocene deposits just described, are those older drifts and gravels which are the remnants of the ancient river deposits of the pliocene tertiary periods. Without entering into a detailed description of these old so-called "alluvial" deposits, I may state that they occur in several parts of this district, and have in most instances been covered by basaltic lava. The basalt has in some places been cut through, and in others entirely washed away, by the denuding influence of the rainfall during the erosion of the existing valleys, so that the formerly buried drifts have become more or less exposed, and rendered accessible to the miner. This has been the case at the Swallows' Nest diggings, near the Campbell's River, about nine miles south-east from the village of Rockley. Here the creek is seen to have eroded its channel to a depth of 200 feet through solid basalt, underneath which is revealed the existence of an ancient river-bed, which crops out on the side of the hill. This old river channel has been driven into by miners and extensively worked, until further progress was obstructed, it is said, by water. At the time of my visit only one party of miners, consisting of Chinese, was at work. It is certain that this lead must extend under the basalt for over six miles in a south-easterly direction, and therefore should receive further notice. There is an interesting feature in connection with this lead, and one, I think, which is of importance. It is this: The lead is worked on a "false bottom," that is the wash-dirt rests on another still older tertiary gravel, or, in other words, the old river has cut its channel into an older alluvial deposit occupying the same ancient valley, just as any river of the present day may be seen to have cut its channel through the previously formed alluvial flat.

This older tertiary drift is of a very water-worn character, and resembles the old auriferous gravels which form the "made hills" of Ballarat and Sandhurst; but in the absence of fossils there is nothing to determine the identity of the deposits beyond their lithological character and relative position with regard to the newer tertiary rocks. I believe, however, that they are of the same age. Below this "false bottom" at Swallows' Nest, a shaft has been sunk in the older drift to a depth of 45 feet without touching the bed-rock, but the great influx of water prevented sinking deeper with only the manual labour of six men, and so the trial was given up. I am informed that gold was found in small quantities in the drift all through it. It is therefore of importance that the gold-bearing character of the "gutter" of this older drift should be tested, for if it be proved payable it will afford employment for hundreds of miners, as I have seen it again near Campbell River seven miles further to the south-east, extending apparently in the direction of the Isabella diggings.

Another similar deposit occurs near the Brisbane Valley Creek, below the Village Reserve at Crete, about 7 miles from Oberon. Here the recent alluvial has been partly derived from the denudation of the older, and has yielded payable gold. A shaft has been sunk through the older drift to a depth (as I was informed by some of the local miners) of 170 feet on to a slate bed-rock, which was dipping fast to the east, so that the true gutter must lie yet deeper in that direction, and not many yards off, as the bed-rock again rises to the surface about 100 yards distant, showing that the old gravel has filled up, as it were, a deep narrow gorge, the bottom of which will be some 100 feet below the level of the present creek. I believe that a sum of £300 would more than cover the cost of sinking a new shaft to test this lead.

About two miles south of Oberon there is another deposit of the same older tertiary quartz pebble drift cropping out from under the basalt on both sides of the Racecourse Hill; but it is of no great thickness, and where prospected it seems not to have been payable. The workings were abandoned, and the tunnels had fallen in, so that I could not obtain particulars regarding them. I do not think, however, that here the gutter had been struck. The course of the drift is more clearly defined in the south-east portion of the Village Reserve about 2 miles further south. Another patch of the drift capped with basalt may be seen on the Duckmaloi Road, about 5 miles from Oberon.

The two most important of the above-mentioned localities where this drift should be prospected are, I consider, at Swallows' Nest and Brisbane Valley.

Copper ores have been found in many parts of the district, and a large amount of money has been expended in prospecting for these ores. The only mine at present worked to the east of Campbell's River is that of the Wiseman's Creek Copper-mining Company. The lode is in talcose schists, which dip S. 79° 45′ W. at 63°; it occupies the fissure of a fault, and strikes N. 15° W., and has a varying dip generally to the east. The ore occurs in bunches along the course of the fault and in off-shoots from it. These bunches and shoots of ore, together with some veins of quartz, are of irregular thickness, being from 1 to 18 ft. The ore is of a very mixed character, and requires careful sorting in classing it for sale; it consists of the green and blue carbonates, sulphides, and black oxide of copper, with the sulphides of lead (galena), zinc (blende), and iron and arsenical pyrites; occasionally a little native copper is met with. Occupying, as it does, the fissure of a fault, this lode will doubtless prove to be a permanent one in depth. The mine is being efficiently worked under the management of Mr. Burt, and the ore is at present being carted to the Macquarie Plains Railway Station, whence it is forwarded by rail to the Eskbank Smelting Works at Lithgow Valley.

The South Wiseman's Creek Copper mine is situated on the south side of the creek, and appears to be on the same line of fault.

Sulphides of copper occur at Essington, where they have been partly worked, but the mine is now idle. Some good specimens of copper ore (sulphides and carbonates) were shown to me by Mr. James Falls, of Oberon, who is about to open the lode. Near Charlton a quartz reef occurs (see note 13 on map) containing sulphides and carbonates of copper, and as it traverses the silurian beds near their junction with the serpentine, it is probably gold-bearing.

On Crown lands near Mrs. Harris' farm, and about 6 miles from O'Connell, there is an outcrop of fissile blue slate, which if opened would, I believe, yield excellent roofing slates and slabs for paving. About half a mile east of this point the silurian rocks are traversed by a reef of common opal, which is of no commercial value, but its occurrence as a reef is somewhat rare.

At Briar Park, near Campbell River, and in various other localities, numerous veins of asbestos occur in the serpentine rocks; some of the asbestos is of fine fibrous quality, and suitable for gas stoves and other purposes; but as yet it has not been found in sufficient quantity to pay for collecting.

Mr. John Brownlow, of Rockley, showed me some good samples of copper ores and gossan taken from the surface of a lode near Thompson's Creek. The ores consist of sulphides and carbonates of copper, with pieces of native copper in brown iron; the outcrop of the lode is said to be of large extent. I purpose inspecting it on my way to the Isabella Gold Field.

From the Oberon district I proceeded to the Trunkey Creek, Copperhannia, and Tuena Gold Fields, and inspected and reported upon certain lands applied for. The general geological features of this country consist of silurian shales, sandstones, conglomerates, and limestones, with occasional intrusive masses of greenstone trap; and at Mulgunnia, the estate of Mr. Warden T. Smith, P.M., there is a small outcrop of granite. Covering these rocks are patches of pliocene tertiary, rounded quartz pebble drift overlaid by basalt. These patches of drift are the remnants of the beds of those ancient watercourses which in pliocene times drained the surface of this country. Streams of lava from volcanoes now extinct flowed into the old valleys, burying the water channels. Subsequently long continued denudation eroded fresh channels through these rocks, deepened the valleys, and thus gradually formed the present physical features. As would naturally be expected these old river beds contain auriferous deposits, which have been more or less profitably worked, and parts of which will yet for a long time afford employment for miners when a good supply of water is available.

The quartz reefs at Trunkey are all in silurian sandstones and shales. Within a distance of 20 chains east of the Trunkey Creek, and near the township, eight distinct reefs have been opened; they have been only partly worked, for with but two exceptions most of the mining operations have not been carried down much below the water level, which is found to be from 75 to 100 feet below the surface. The strike of the reefs generally coincides with that of the strata, which is N. 3° E. with a westerly dip at about 65°, but the Bathurst Company's reef, which lies about half a mile to the west, and has been mined to depth of 550 feet, dips to the east. It would appear therefore that the reefs occur in the same set of beds which crop out on each side of a synclinal axis; and it is probable that as far as these beds can be traced along the course of the synclinal, which is nearly north and south, auriferous reefs will be found. These reefs are usually narrow, varying in thickness from 2 inches to 3 feet, and the yield from them is stated to have been from 5 dwts. to 6½ ozs., and 15 ozs. in one claim, to the ton. I am indebted to Mr. Hinwood, Secretary to the Sydney Trunkey Creek Gold-mining Company, for the following particulars of quartz crushed at the Lady Belmore battery, under the direction of the Company's Manager and Engineer, Mr. Bennet :—

1877.

			ozs.	dwts.	grs.
Young Australian	38 tons.	Average yield per ton	0	14	12
Crummie's Line	32 „	„ „	1	9	18
Eddington's Line	28 „	„ „	2	1	9
American Star Line	75 „	„ „	0	19	18
Black Reef	139 „	„ „	0	10	23·9
Electric Spark	66 „	„ „	1	0	15
Lloyd's Block Claim	47 „	„ „	0	5	6
Arthur's Line	35 „	„ „	1	3	5

As regards the working of these reefs, their close proximity to each other, and their high angle of dip, afford facilities for very systematic mining operations.

At the Pine Ridge, near the lower part of Copperhannia Creek, is "Wilson's Reef." Here a mass of diorite about 100 yards wide is traversed in all directions by veins of quartz from 1 to 18 inches thick, and small veins of chlorite. The whole mass is quarried, and when crushed without being sorted, yields up to 2 dwts. to the ton ; but when sorted and the quartz alone crushed, the yield is about 6 dwts. to the ton. The stone is sent from the mine by an inclined tramway down to the crushing machine, which consists of a battery of 15 head of stampers, worked by a water-wheel 40 feet in diameter, 4 feet in width, and provided with 90 buckets ; this wheel is driven by water brought in a race from the Copperhannia Creek.

Dykes of diorite are seen again in places for a few miles north from the Pine Ridge mine. I saw several parties of Chinese working the bed of the creek. There can be no doubt that in the drier seasons the alluvial deposits along this creek will give remunerative employment to miners for many years to come ; and also that the gold in these deposits is evidence of gold-bearing reefs in the neighbouring hills.

On the Mountain Run Creek, west of Trunkey, some rich alluvial ground has been worked, and is still far from being worked out ; but owing to the last three seasons of drought mining has been almost impossible. At this place the gold has been chiefly derived from a newer pliocene lead, a portion of which for about 2 miles down the valley still remains. It consists of semi-waterworn drift and clay, filling a channel about 50 yards wide and over 120 feet deep. I am of opinion this lead should pay well to work if a sufficient supply of water were brought to it. The waters of the Rocky Bridge Creek might probably be made available for this purpose. A lease of 25 acres embracing a portion of this lead is now held by Mr. Parsons.

In company with Mr. Warden T. Smith, Mr. Bennet, of Trunkey, and my assistant, Mr. W. E. Jennings, I inspected the Abercrombie Caves, which are situated on the Grove Creek, about 9 miles from Trunkey. They consist of one large cavern with several smaller passages leading from it. The large one is a natural tunnel about 200 yards long, 20 to 60 yards wide, and 50 feet high, the interior of which is ornamented with numerous stalactites and stalagmites of most grotesque and fanciful forms, which inspire the visitor with thrilling feelings as of enchantment. The vaulted roof is coloured in places pink and green mottled with white, caused by some minute fungoid or other vegetable growth, producing a very pleasing effect ; and the beauty of the whole scene is still further enhanced by the admission of daylight from the upper and lower entrances of the tunnel. Around these entrances and even within them may be seen different varieties of ferns—some nestling in sheltered crevices in the rocks, and others clinging to the wet walls or hanging gracefully from projecting ledges of the white marble limestone. Through this beautiful and decorated arch of nature the Grove Creek flows over a gravelly bed, leaving here and there a quiet pool of clear water. The gravel contains a little gold, but not in sufficient quantity to pay for working. The marble limestone is full of corals, encrinities, &c., and is interbedded with silurian shales and sandstones which compose the high and rugged ranges rising steeply on both sides of the creek. Having climbed up into one of the smaller caves leading off from the main cavern we found it inhabited by wombats which had made numerous burrows into the red earth deposit forming the floor of this cave. It is impossible the wombats could have entered by the way that we did, so that they must have some other back entrance not yet known to us. The Abercrombie Caves were first discovered by the late Surveyor General Davidson when making the survey of the Grove Creek.

We next proceeded to the opal mines on the Rocky Bridge Creek, examining on our way the diggings near the Trunkey Consols Mine, and at Croaker's Reef; at both of which places gold-bearing quartz reefs have been found and much alluvial mining done, but all of them are now abandoned, though I believe the favourable auriferous indications they present should induce prospectors to give them a good trial. At Croaker's, where one reef is of a very pyritous character, a bed about 12 inches or more thick of heavy spar or sulphide of baryta has been struck; it is of no commercial value, though its occurrence is of interest to record.

The opal mine is on the west side of Rocky Bridge Creek, above the junction of that creek with the Abercrombie River. The matrix of the opal is a horizontal layer 30 feet thick of soft decomposed vesicular basalt, which forms part of an old lava stream which flowed down and partly filled up the valley of this creek in the pliocene period, and it is probable that under this basalt is the bed of the ancient watercourse containing gold deposits. The numerous vesicular cavities in the basalt are in some instances only half filled, and in others completely filled with precious opal and common opal and hyalite, which have been formed by infiltration of silicious water from the rock mass. The precious variety is semi-transparent and displays fine colours of green, blue, and red shades; but specimens of a size suitable for jewelry purposes can rarely be obtained, so that though this opal rock is of unlimited extent, I doubt much if it would at the present high price of labour pay to search for opals. The basalt crops out on the side of a steep range, and could easily be broken out in large masses. The surrounding country is of silurian formation, traversed by quartz reefs, some of which must be auriferous, as the alluvial deposits in the creek are now profitably worked for gold. A few miles to the north granite occurs, and appears to extend in the direction of Carcoar.

On the 19th of December I returned to Sydney to arrange the geological and mineralogical collection to be sent from this Department to the Universal Exhibition at Paris. A large collection of minerals and fossils illustrative of the mineral resources and geology of New South Wales was exhibited by the Department of Mines at the last Intercolonial Exhibition of the Agricultural Society held in Sydney in April, and in August a similar though somewhat smaller collection was sent to the Brisbane Exhibition.

I may here mention that I tested the red tertiary clay which occurs in large quantities near Gulgong. It was found that by simply washing the clay, and after allowing the coarse particles to settle by running off the finer sediment and collecting it by filtration and drying, a red ochre was obtained suitable for making a good red paint. The ochre was tried for chromolithographic purposes by Mr. Eccles, of the Surveyor General's department, and it produced a good sienna colour. Owing to the high rate of carriage from Gulgong it is doubtful if it would at present pay to manufacture the ochre for the Sydney market, but for the requirements of the Gulgong and Mudgee districts I think it might be prepared with advantage.

On the 29th of December I reported upon the samples of auriferous black sand and quartz obtained in New Guinea by Mr. Goldie and the Rev. W. G. Lawes. The gold and sand are now in the Museum of Mines, having been presented by Mr. J. Macdonald, of Messrs. Mason Bros., Mr. Goldie's agents in Sydney. Though the existence of gold in New Guinea had been previously suspected after examination of the rock specimens collected by the Hon. William Macleay, M.L.C., and Signor D'Albertis, the actual discovery of the precious metal was first made by Mr. Goldie and the Rev. W. G. Lawes.

I have the honor to be,
Sir,
Your obedient servant,
C. S. WILKINSON, L.S., F.G.S.,
Government Geological Surveyor.

APPENDIX.

DONATIONS to the Museum of Mines during the year 1877.

Name of Contributor.	Contributions.
Mr. G. H. Gower	Collection of tin ores, &c., New England District.
Mr. H. Norton	Kerosene shale, America Creek.
Do.	Metamorphosed slate, near Queanbeyan.
Do.	Anthracite, Mittagong.
Do.	Obsidian, New Hebrides.
Do.	Copper ore, near Queanbeyan River.
Mr. H. A. Thompson	Stream tin, Tasmania.
Mr. F. Dalton, P.M.	Hæmatite, &c., Cobundry Range.
Mr. R. F. Wright	Graphite, New England.
Do.	Coal, between Tenterfield and Grafton.
Do.	Quartz with cubical pyrites, Toorook.
Do.	Serpentine, Gundagai.
Mr. C. Stuart	Petrified wood, Northern District.
Mr. J. K. Hume	Silurian fossils, Yass Plains.
Mr. Phillips, L.S	Quartz geode and agate, Gunningbland.
Mr. W. S. Campbell	Pecopteris, Mount Victoria.
Mr. T. C. Just	Bismuth, limestone, tin ore, galena, iron ore, auriferous quartz, Tasmania.
Hon. F. B. Suttor, M.P	Copper ore and regulus, Snowball Mine.
Mr. H. Copeland, M.P.	Quartz crystals, &c., Peel River.
Mr. W. H. Grace	Obsidian, Katoomba.
Mr. J. S. Clements	Miscellaneous collection, Namoi River.
Mr. Rees	Do. Nundle.
Mr. F. A. Franklyn	Native copper, Jackson River.
Mr. R. D. Adams	Altered talcose schist, Snowball Mine.
Mr. W. M. Thomas	Fossil nuts and iron ore, Home Rule.
Mr. Davies	Copper ore, Cotter and Queanbeyan Rivers.
Mr. F. H. Williams	White jasper, Woolomon.
Mr. W. P. Faithful	Auriferous pyritous tailings, Queensland.
Mr. Gipps	Fossil remains of *Diprotodon australis*, Manduran.
Do.	Stone tomahawks, Castlereagh River.
Mr. E. P. Ramsay	Indurated shale, Queensland.
Mr. W. C. Browne, M.P.	Pachydomus and terebratula, Combo, near Singleton.
Mr. Coupland	Galena, near Murrumburrah.
Mr. Gaden	Miscellaneous collection, New England.
Mr. H. Rosengrove	Copper ore, Upper Bingera.
Dr. Youngson	Asbestos, Carrangera.
Mr. Greville, M.P.	Sulphate of baryta, near Braidwood.
Mr. Liddle, L.S.	Quartz with chlorite schist, near Binda Caves.
Mr. Brown	Sample of sand, Young.
Mr. T. C. Cromie	Miscellaneous collection, Rockley.
Mr. J. Daw	Pyroxine and epidote, Lucknow.
Do.	Quartz containing copper, Lucknow.
Mr. W. Fletcher	Roots from Limestone Caves, Gulgong.
Mr. De Boos, J.P.	Miscellaneous collection, Southern District.
Mr. Rees Llewelling, J.P.	Pyritous quartz, Major's Creek.
Mr. J. Griffin, J.P.	Petrified wood, Shoalhaven River.
Mr. J. Heazlett	Quartz, Major's Creek.
Mr. J. Buchanan, P.M.	Collection of tin ores, New England.
Mr. T. A. Smith, P.M.	Miscellaneous collection, Trunkey.
Mr. Geo. Macdonald	Asbestos, Back Creek.
Mr. Martin, P.M.	Iron and copper pyrites, Glen Innes.
Mr. Sharpe, P.M.	Miscellaneous collection, Western District.

copper, and traversing ferruginous chloritic schists; W. 30°, S. at 75°.

NOTE 14.

Blue slates, of fair quality, for roofing purposes.

NOTE 15.

Hard clinkstone, containing crystals of hornblende. It is weathered into irregular masses standing up in grotesque rugged pinnacles, which emit a metallic sound when struck.

NOTE 16.

High basaltic tableland about 3,400 feet above sea level. The basalt in places rests on auriferous quartz pebble drift. (Pliocene Tertiary.)

NOTE 17.

Silurian schists and sandstones traversed by numerous quartz reefs, and capped in places with auriferous quartz pebble drift. (Pliocene Tertiary.)

REPORT UPON THE THEORETICAL CALORIFIC POWER OF CERTAIN SAMPLES OF NEW SOUTH WALES COAL.

THE following results were obtained from a series of experiments made with the calorimeter upon the samples of Coal collected by the Mining Department, and submitted to me for examination in 1875. (*Vide* Report of the Mining Department for that year.)

These results represent the theoretical calorific or evaporative power of the samples, *i.e.* the weight of water which would be converted into steam by the complete combustion of one pound of each of the various coals respectively.

It must, however, be clearly understood that the actual heat producing or evaporative power of a coal obtained in practice depends very greatly upon the size, construction, and form of both furnace and boiler, as well as upon the method of firing or burning, and upon many other equally obvious circumstances; it will, therefore, be apparent that the results can only be *rigidly* compared when the conditions under which the fuels are burnt are alike, as was the case in the experimental trials.

No. 1.	Waratah Mine	14·3 lbs.
„ 3.	Anvil Creek Mine	12·65 „
„ 4.	Russell's Mine	13·21 „
„ 5.	Greta Mine	13·21 „
„ 6.	Wallsend Mine	13·21 „
„ 7.	A. A. Company's Mine	12·92 „
„ 8.	Bowenfells Mine	12·65 „
„ 9.	Eskbank Mine	12·65 „
„ 10.	Vale of Clywdd Mine	12·1 „
„ 11.	Lithgow	12·1 „
„ 12.	Mount Kembla	13·21 „
„ 13.	Mount Keira	12·92 „
„ 14.	Berrima	11·82 „

ARCHIBALD LIVERSIDGE.

REPORT UPON MINERAL SPECIMENS EXAMINED FOR THE MINING DEPARTMENT, DURING THE YEAR 1877.

By **Archibald Liversidge**, Professor of Geology and Mineralogy in the University of Sydney.

Sample No. 1.

Copper Ore.—Prince of Wales Mine, Bingera. A mixture of rich copper pyrites, with the same ore of poorer quality. The two varieties were examined separately.

The rich portion, marked 140, yielded 39·57 of metallic copper, and the poorer part, marked A, yielded metallic copper at the rate of 16·56 per cent., the mean being 28·065 per cent. metallic copper.

Traces only of gold and silver were found to be present in both portions.

Four samples from the Kaiser Gold Mining Company, Co. Lincoln.

Sample No. 2.

Bag of sand from the dam, of a brown colour. No diffused copper ore visible to the naked eye.

Gold	... 0 oz. 1 dwt. 7 grains per ton.
Silver	... Under 1 ounce.
Metallic copper	... 6·062 per cent.
Sulphur	... ·212 „

Sample No. 3.

Sand from the blankets, grain of yellow and purple copper pyrites (bornite), plainly visible.

Gold	... 0 oz. 11 dwts. 2 grains per ton.
Silver... ...	... 7 „ 1 „ 18 „ „
Metallic copper	... 40·275 per cent.
Sulphur ...	... 11·495 „

Sample No. 4.

Tailings from present crushings. Grains of copper ore plainly visible, as in No. 5.

Gold	... 0 oz. 1 dwt. 7 grains per ton.
Silver	... Under 3 ounces „
Metallic copper	... 20·219 per cent.
Sulphur ...	... 5·220 „

Sample No. 5.

Stone from the lode at a depth of 50 feet. A mixture of yellow and purple sulphides of copper, associated with a green chloritic vein stuff or gangree.

Gold	... 0 oz. 2 dwts. 14 grains per ton.
Silver	... Under 3 ounces „
Metallic copper	... 14·338 per cent.
Sulphur ...	... 6·978 „

Extract from Letter:—"This stone in crushing coats the quicksilver, and consequently it will not amalgamate."

Sample No. 6.—Adelong.

CHRYSOCOLLA.—This mineral was forwarded to the Department as an ore of nickel. It is, however, a light green coloured variety of the hydrated silicate of copper known as chrysocolla.

Sample No. 7.

SO-CALLED MEERSCHAUM.—Forwarded to the Department as a specimen of meerschaum. It is, however, a silicate of alumina, and the following is the description and analysis of a similar sample from the Richmond River:—*

White in colour, easily cut, the hardness being about 2·0. Specific gravity, after long soaking in water, is 1·168. When first immersed it floats readily. The fracture is, more or less, well-marked conchoidal; it occasionally shows traces of stratification, and is said to contain leaf impressions. Very porous, and adheres strongly to the tongue. Before the blowpipe it blackens slightly at first, and becomes harder after ignition; infusible; yields a blue-coloured mass when heated strongly after moistening with cobalt nitrate.

ANALYSIS.

Water given off at 100 ° C	3·28
Combined water (loss on ignition)	4·34
Insoluble silica	51·35
Soluble „	·11
Alumina	37·72
Iron sesquioxide	·46
Lime	·34
Magnesia	1·25
Alkalies	Traces
Carbonic acid	1·54
	100·39

Sample No. 8.—Gulgong.

CHROMIC IRON.—Of rich quality. No analysis made.

Sample No. 9.—Hodgkinson River, Queensland.

ANTIMONITE.—Associated with cervantite, the yellow oxide of antimony.

Metallic antimony	54·5 per cent.
Gold and silver	Traces.
Specific gravity	4·53

Sample No. 10.—Hodgkinson River, Queensland.

ANTIMONITE.—A remarkably compact form of antimonite, possessing a finely granular structure instead of the usual crystallized and bladed form. Breaks with a well-marked conchoidal fracture, and flies to pieces when struck smartly, as if it were in a state of tension.

The specific gravity is rather lower than the usual form of antimonite, being 4·40 as against the 4·53 of sample No. 9.

The external surfaces, probably where the vein came in contact with the rock, were coated with cervantite.

ANALYSIS.

Antimony, metallic	70·813 per cent.
Silica	1·880
Gold and silver	Mere traces.

---

* *Vide* Journal, Royal Society, N.S.W., for 1876.

Sample No. 11.—***Lock's Platform, Great Western Railway.***

Contains but traces of gold.
Silver, 7 ozs. 11 dwts. 15 grains per ton.

Sample No. 12.—***Lock's Platform, Great Western Railway.***

A light-coloured vein stuff, containing pyrites and galena.
Contains but traces of gold.
Silver, 5 ozs. 11 dwts. 15 grains per ton.

Sample No. 13.—***Richmond River.***

SO-CALLED MEERSCHAUM.—See sample No. 7.

Sample No. 14.—***Snow Ball Copper Mine.***

A variety of granular, and in parts lamellar magnetite, associated with white quartz. Sent in to be tested for lead, gold, and silver, all of which were entirely absent.

Sample No. 15.—***Braidwood.***

EISENKIESEL AND BROWN HÆMATITE.—A variety of ferruginous quartz termed eiskenkiesel, together with some fragments of brown hæmatite.

Sample No. 16.—***Braidwood.***

ZINC BLENDE—

Gold	0 oz. 15 dwts. 16 grains per ton.
Silver	11 „ 15 „ 4 „ „

Sample No. 17.

A specimen of noumeite—the hydrated silicate of nickel (sent from the Braidwood District). An analysis was considered unnecessary.

Sample No. 18.

A resinous substance, burning with a smoky luminous flame and leaving a large amount of ash. Although this specimen was accompanied with the statement that large deposits of it occur in Riverina, and that it can be delivered in Melbourne at the rate of £2 per ton, there is but little doubt that the substance is merely a fragment of an artificial cement, such as is used in the insulating cups of telegraph poles.

Sample No. 19—(4,863)—*Upper Bingera.*

COPPER ORE.—A mixture of poor earthy blue and green carbonates of copper.

Metallic copper	4·505 per cent.
Silver	Under 2 ozs. per ton.
Gold	0 oz. 3 dwts. 6 grains per ton.

Sample No. 19A—(4,862)—*Upper Bingera.*

Very similar to the above.

Metallic copper	3·655 per cent.
Silver	Under 2 ozs. per ton.
Gold	0 ozs. 5 dwts. 5 grains per ton.

Sample No. 20.—***Gulgong.***

A variety of pyroxene associated with albite; of no commercial value.

Sydney: Thomas Richards, Government Printer.—1878.

DEPARTMENT OF MINES
SYDNEY.

MINES AND MINERAL STATISTICS.

92

ANNUAL REPORT

OF THE

DEPARTMENT OF MINES,

NEW SOUTH WALES,

FOR THE YEAR

1878.

By Authority:
SYDNEY: THOMAS RICHARDS, GOVERNMENT PRINTER.

1879.

[10s.]

C

MEMORANDUM.

THE Under Secretary having submitted to me the Annual Report of the Department of Mines for the year 1878, I take the opportunity afforded me of expressing my opinion of the working of the Department, and, generally, of the state of the mining industries of the Colony.

During the year 1878, as stated by the Under Secretary, the Occupation Branch, the Roads Branch, and the Stock Branch of the Lands Department, have been placed under the superintendence of the Mining Department; and, although in this change the officers and clerks of each of these Branches have remained in charge of their several sub-departments, considerable additional work has been cast upon the Department of Mines, and, as a matter of course, the Under Secretary and many of the officers have had increased duties to perform of an onerous kind. I am happy in being able to state it as my opinion that, notwithstanding their additional labours, they have performed their duties efficiently and zealously.

It is a matter of congratulation, that notwithstanding the yield of that metal (viz., gold) which was a few years ago the great mineral production of the country has considerably decreased, the total value of our mineral productions for the year 1878 remains much the same as that of past years, being above the average value of the last ten years by about £40,000. This result is due chiefly to the increased yield of coal, which has steadily grown, year by year, till out of a total mineral production in the Colony for the year 1878 valued at £2,172,000 it reached in that year a value of £921,000.

It is also satisfactory to learn that, as regards other minerals and metals, such as shale, copper, and silver, in which the Colony is now proved to be very rich, the production is somewhat greater than in previous years, notwithstanding that the price of one of these metals, viz., copper, keeps at a very low rate.

As regards the production of gold, it may be anticipated that ere long this great branch of our mining industry will revive. There is always the great probability existing of new gold fields being discovered, particularly in that vast unprospected country lying at the west and north-west of the Colony; and, in addition to this, the gold miner is now successfully working auriferous reefs at depths at which it was thought some time back improbable, if not impossible, that payable gold could be obtained.

The continued annual yield from our various mines of over two million pounds' worth of metals and minerals is a circumstance of which so young a country as New South Wales may well be proud; particularly when it is considered that this amount is derived not wholly, or even in a great degree, from a metal so uncertain in its yield as gold, but from a variety of other valuable metals and minerals. It may be reasonably anticipated that a great expansion must take place in the production of such vast mineral treasures as the Colony possesses, when the improved mechanical appliances are brought into operation amongst us which are now so much in use in many of the old countries of the world, and when the capitalist becomes alive to the great wealth which can be obtained by the investment of his money in legitimate mining enterprises.

The establishment of a separate Department of the Government to superintend generally the mining affairs of the country, presided over by a responsible Minister, and having its staff of scientific men and skilled officers, is beginning to exert a salutary effect on mining enterprise. The valuable collection of mineralogical and geological specimens in the mining museum—the assay of ores and metals which can always be made free of cost to the public—the geological surveys made and the scientific information ever being afforded by the Government Geologist and his assistants—and last not least, the information on the mining laws, and instruction as to the best and most rapid manner of obtaining a secure holding of mineral land which are accorded to those who ask, by the Under Secretary for Mines—all urge on the path of progress the miner and those taking part in mining ventures.

It is to be hoped that in the future the Mining Department may be of more utility to the public in furthering mining enterprise than it has even been in the past. Much may yet be done to assist the working miner and to give security to capital by judicious amendments in our mining laws, by affording reliable information on the important subject of water supply to mining districts, and by directions from scientific men on the treatment of ores and minerals. The Legislature has hitherto shown considerable liberality in the establishment and maintenance of a Department of Mines, in the hope, doubtless, that it would tend to the increased production of our mineral resources; and I cannot but express my confidence that it will be proved in the future that Parliament took a wise course in following the footsteps of other countries in the establishment of such a Department, and that its maintenance will give a great and continued impetus to the development of the vast mineral wealth which in New South Wales now—to a great extent—lies dormant awaiting additional enterprise and capital.

Mining Department, E. A. BAKER.
Sydney, September 10th, 1879.

TABLE OF CONTENTS.

PAGE.
Summary—Total Quantity and Value of Minerals ... 44, 45
,, Quantity of Land under Lease, &c. ... 1
Gold ... 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
,, Tables—Royal Mint Returns ... 7
,, ,, Customs Returns ... 8
,, ,, Mining Registrars' Returns ... 8, 9
,, ,, Average yield, Alluvial Mines ... 9
,, ,, ,, Quartz Mines ... 10
,, ,, Number of Miners, Value, &c., of Plant, Depths, Average Yields, &c. ... 46–60
,, Assays of Samples ... 10, 11
,, ,, Tailings ... 12
,, ,, Waste ... 13
,, Reports on Gold Fields in the Barrington District by the Geological Surveyor ... 159–164
,, Reports on Gold Fields (*See* Wardens' and Mining Registrars' Reports.)
,, Reports on Gold Fields, Inspector of Mines' ... 133–136
Coal ... 13, 14, 15, 16, 17, 18, 19
,, Table Exports—Intercolonial and Foreign ... 14
,, ,, Home Consumption ... 14
,, ,, Average price ... 14
,, ,, Output of Coal, Number of Mines, &c., &c. ... 137
,, Analysis of Coal ... 16, 17, 18, 19
,, Report of Examiner of Coal Fields, with Tables of Output, Exports, Accidents, &c., &c. ... 138–145
,, Report of Inspector of Collieries ... 146–148
Shale—Output, Value, &c. ... 19, 20, 137
,, Report of Examiner of Coal Fields ... 139 & 145
Tin ... 20, 21
,, Tables—Quantity and Value of Tin, Number of Miners, &c. ... 21, 50
,, Northern Fields—Mr. Warden Fraser ... 87, 88
,, ,, ,, Mr. Warden Martin ... 88, 89
,, ,, ,, Mr. Warden Graham ... 90–95
,, ,, ,, Mining Registrars ... 123, 124, 126 to 130, 132
Copper ... 22 to 30
,, Tables—Quantity and Value of Copper, Number of Mines, &c. ... 22 & 50
,, Percentage Composition of Ores ... 29
,, Assays ... 25 to 29
,, Wardens' Reports ... 61, 62, 63, 69, 87
,, Mining Registrars' Reports ... 97, 99, 100, 118, 122, 132
Iron ... 30, 31
Silver and Lead ... 31–42
,, ,, Assays of Ores from Mines at Boorook ... 31, 32, 33
,, ,, Treatment of Ores—Report by Mr. W. A. Dixon, F.C.S., &c. ... 33 to 35
,, ,, ,, ,, Report by Mr. Lamont Young, F.G.S. ... 35 to 42
,, ,, Reports—Mr. Warden Graham ... 32, 33, 90 to 95
,, ,, Reports of Mining Registrars ... 115, 129, 131
Antimony ... 43

PAGE.

OTHER MINERALS 43

REPORTS ON GOLD FIELDS, TIN FIELDS, &c. :—

- Bathurst Mining District—Mr. Warden Smith 61
  - Orange Division—Mr. Warden Lane 62
  - Carcoar ,, Mr. Warden North 62
  - Bathurst ,, Mr. Mining Registrar Maybury 97
  - Trunkey ,, Mr. Mining Registrar Waldie 98
  - Tuena ,, Mr. Mining Registrar Cotter 99
  - Carcoar ,, Mr. Mining Registrar Warner 99
  - Cowra ,, Mr. Mining Registrar Arkins 100
  - Rockley ,, Mr. Mining Registrar Cromie 100
  - Orange ,, Mr. Mining Registrar Evans 100
  - Mitchell Creek Division—Mr. Mining Registrar Shumack 100
- Tambaroora and Turon Mining District—Mr. Warden Sharpe 63
  - Hill End Division—Mr. Mining Registrar Burne 101
  - Sofala ,, Mr. Mining Registrar Fagan 101
  - Ironbarks ,, Mr. Mining Registrar Hanley 102
- Mudgee Mining District—Mr. Warden Browne 67
  - Gulgong and Home Rule Division—Mr. Mining Registrar De Boos 103
  - Mudgee Division—Mr. Mining Registrar Isaacs 103
  - Hargraves ,, Mr. Mining Registrar O'Brien 104
  - Wellington ,, Mr. Mining Registrar Marsh 104
  - Windeyer ,, Mr. Mining Registrar Price 105
- Lachlan Mining District—Mr. Warden Dalton 71
  - Southern Division—Mr. Warden Robinson 77
  - Forbes ,, Mr. Mining Registrar Osborne 105
  - Parkes ,, Mr. Mining Registrar Weston 106
  - Cargo ,, Mr. Mining Registrar Hutton 107
  - Grenfell ,, Mr. Mining Registrar Brodie 108
  - Young ,, Mr. Mining Registrar Edwards 109
- Southern Mining District—Mr. Warden De Boos 79
  - Braidwood Division—Mr. Mining Registrar Robertson 110
  - Araluen ,, Mr. Mining Registrar Carlile 111
  - Major's Creek ,, Mr. Mining Registrar Heazlett 111
  - Little River ,, Mr. Mining Registrar Galway 112
  - Nerrigundah ,, Mr. Mining Registrar Foster 113
  - Nowra ,, Mr. Mining Registrar Lovegrove 114
  - Moruya ,, Mr. Mining Registrar Clarke 115
  - Gundaroo ,, Mr. Mining Registrar Irwin 115
  - Nerriga ,, Mr. Mining Registrar Woollan 116
- Tumut and Adelong Mining District—Mr. Warden Vyner 84
  - Albury Division—Mr. Warden Brownrigg 84
  - Tumut ,, Mr. Mining Registrar Hilton 116
  - Adelong ,, Mr. Mining Registrar Morris 116
  - Gundagai ,, Mr. Mining Registrar Weekes 118
  - Kiandra ,, Mr. Mining Registrar Smyth 118
  - Queanbeyan Division—Mr. Mining Registrar Williams 119
  - Yarrara ,, Mr. Mining Registrar Armstrong 119
  - Albury ,, Mr. Mining Registrar Crommelin 119

PAGE.

Reports on Gold Fields, Tin Fields, &c.—*continued.*

Peel and Uralla Mining District—Mr. Warden Buchanan 84
Tamworth Division—Mr. Warden Irving 86
Bingera ,, Mr. Warden Brougham 86
Inverell ,, Mr. Warden Fraser 87
Glen Innes ,, Mr. Warden Martin 88
Dungog ,, Mr. Warden C. G. Smith 89
Barrington ,, (Coolongolook)—Mr. Warden Rowling 90
Armidale ,, Mr. Mining Registrar Marriott 120
Nundle ,, Mr. Mining Registrar Kermode 120
Barraba ,, Mr. Mining Registrar Flanagan 122
Bingera ,, Mr. Mining Registrar Doyle 122
Scone ,, Mr. Mining Registrar Wilshire 123
Tingha ,, Mr. Mining Registrar Jones 123
Uralla ,, Mr. Mining Registrar Dewson 125
Walcha ,, Mr. Mining Registrar Love 125
Wingham ,, Mr. Mining Registrar Creagh 126
New England and Clarence Mining District—Mr. Warden Graham 90
Lismore Division—Mr. Warden Elliott 95
Vegetable Creek Division—Mr. Mining Registrar Gower 126
Dalmorton ,, Mr. Mining Registrar Poole 131
Lunatic ,, Mining Registrar Synge 131
Lionsville ,, Mr. Mining Registrar Fisher 131
Ballina ,, Mr. Mining Registrar Bassman 132
Wilson's Downfall ,, Mr. Mining Registrar Hicks 132
Bourke Mining District—Mr. Warden Grant 96
Bourke Division—Mr. Mining Registrar Harvey 132
Report of Land Agent, Berrima 133
Report of Inspector of Mines 133
Progress Report of Geological Survey, by Mr. C. S. Wilkinson, F.G.S., Geological Surveyor in charge 149 to 158
Report on Specimens from New Guinea, by Mr. C. S. Wilkinson 158, 159
,, Barrington Gold Fields 159–164
,, on a Species of Unio, by Mr. R. Etheridge, junr., F.G.S. 164 to 169
Descriptive Notes on the Tertiary Flora of New South Wales, by Baron Ferdinand von Müeller, C.M.G., M. & Ph.D., F.R.S. 169 to 172
Report on Gold Fields, County of Harden, by Mr. Lamont Young, F.G.S., &c. 175 to 177
Report on Bingera Gold Field, by Mr. Lamont Young, F.G.S. 178 to 179
List of Donations to the Museum of Mines, Sydney 173 to 175

ANNUAL REPORT.

To the Honorable E. A. Baker, M.P., Minister for Mines, &c., &c.

Sir,

I have the honor to report that notwithstanding that during the year 1878 important additions were made to the work of this Department by the transfer from the Department of Lands of the following Branches,—the Occupation of Crown Lands, the Minor Roads, Streets, and Gates, and the Stock Brands and Pounds,—the work of the Department has been carried on satisfactorily, and the officers of the several branches have performed their duties with commendable zeal and efficiency.

I do not propose in this Report to refer to the work of the above-mentioned branches further than to invite attention to the fact that the amount of work performed since the transfer is creditable; at the same time I trust that when opportunity shall have been afforded for the introduction of certain proposed alterations greater efficiency will be secured.

As regards the work of the Mining Department proper, the number of applications to lease land for mining purposes received during the year 1878 is 683; of these 502 were for auriferous, and 181 were for mineral lands. During the same year 339 applications for gold-mining leases, representing in the aggregate about 1,558 acres, and 246 applications for mineral leases, representing in the aggregate about 10,126 acres, have been disposed of. In addition to these, eighty-two applications, under sections twenty-seven and twenty-eight of the Mining Act, for permission to mine under reserved lands have been received, and 133 have during the year been dealt with (*i.e.*, granted or refused).

The following table shows the area of land (other than purchased land and land held in virtue of miners' rights and mineral licenses) occupied for mining purposes, and the minerals being or to be mined for therein :—

Area of land held under lease, and application to lease Crown Lands, and authority to mine upon reserved lands.

Mineral.	Mining Act, 1874.			Gold Fields Act, 1866.			Crown Lands Occupation Act, 1861.			Totals.		
	a.	r.	p.	a.	r.	p.	a.	r.	p.	a.	r.	p.
Gold	2,795	2	5	693	2	2	....			3,489	0	7
Antimony	80	0	0	....			....			80	0	0
Asbestos	40	0	0	....			....			40	0	0
Coal	11,358	0	28	....			9,322	2	0	20,680	2	28
Copper	1,880	0	8	....			1,000	0	0	2,880	0	8
Iron	80	0	0	....			20	0	0	100	0	0
Lead ore	20	0	0	....			....			20	0	0
Shale	22	2	0	....			....			22	2	0
Silver	200	0	0	....			....			200	0	0
Silver and lead	....			....			40	0	0	40	0	0
Silver and copper	....			....			40	0	0	40	0	0
Slate	40	0	0	....			20	0	0	60	0	0
Sulphur	40	0	0	....			....			40	0	0
Tin	6,419	2	4	....			4,054	1	0	10,473	3	4
Minerals not stated	30	0	0	....			1,057	1	33	1,087	1	33
	23,005	3	5	693	2	2	15,554	0	33	39,253	2	0

I am happy to say nearly all the old applications to lease have now been disposed of, and would have been quite cleared off but for the difficulty of getting the land measured. To this cause is also due the delay in dealing with more recent applications; however, I trust the steps lately taken by this Department, and the valuable aid rendered by the Surveyor General, will lead to a speedy reduction of the arrears of work on some of the principal gold-fields.

In addition to the land occupied for mining purposes, as shown in the above table, a very considerable extent of mineral (especially coal and tin) land is held under conditional purchase or in fee simple, and a quantity of auriferous land is held as claims under miners' rights.

The exertions made during the past year to collect and disseminate information respecting the mineral wealth of this Colony, and to impart the most accurate information as to the available lands which contain minerals of economic value, and the course to be pursued in order to secure possession of such land, have been unremitting. For the information and encouragement of persons engaged in prospecting a very large number of samples of ore have been examined and reported upon, and in addition thereto sixty-eight assays and analyses have been made for prospectors, and the results communicated to them.

The work of collecting geological and mineral specimens has been carried on during the year with unabated vigour, as evidenced by the very large and excellent collection sent to the International Exhibition in Paris, consisting of over 1,000 specimens, besides small collections sent to New Zealand and elsewhere, and the collection in the Museum, numbering over 7,000 specimens. From this collection, which will in the meantime be largely increased, an instructive and complete exhibit will be furnished for our forthcoming International Exhibition,—an exhibit that, I trust, will do justice to the mineral wealth of the Colony, and reflect credit upon this Department.

Not only are the awards made by the Judges at the Paris Exhibition for our mineral and geological exhibits most flattering to this Department, but the comments upon the collection show most conclusively that there, as at Philadelphia, the labours of the Department have tended in no small degree to make known the extent and value of our mineral resources, and to attract attention to this Colony as a field for the profitable investment of capital in mining pursuits.

During the past year, in addition to the collection and exhibition of specimens, the Geological Surveyor (Mr. C. S. Wilkinson, F.G.S.) and his staff (two assistant Geological Surveyors having been appointed since my last report) have examined numerous gold-fields in the Bathurst, Trunkey, Carcoar, Cowra, Canowindra, Forbes, and Bingera Districts, besides those in the counties of Monteagle and Harden, with a view to the re-adjustment of their boundaries, in order that lands not required for mining purposes may be made available for settlement. The Geological Surveyor was also engaged upon the Prospecting Board during some three months of the year.

The Geological Surveyor, with the assistance of Mr. Lamont Young, Assoc. R.S.M., made a careful examination of the Fish River Caves, and furnished a very valuable and interesting report thereon, which will be published separately.

During the year the Harden and part of the Burrangong gold-fields have been carefully examined, and geological maps thereof are hereto appended. Mr. Wilkinson has also examined and reported upon the Barrington gold-fields. Towards the latter end of the year Mr. T. S. Parrott was engaged to make an underground survey of the principal mines at Hawkins Hill, Hill End, as well as of the topographical features, and he has furnished a series of very interesting sections showing the underground works of the several mines and the dip and strike of the various quartz-veins. These sections are not only most instructive to those interested in these once famous mines, but they are specially valuable in connection with the geological survey of Hill End, now being carried out by Mr. E. F. Pittman, under the direction of Mr. Wilkinson. When this survey shall have been completed and the map thereof published, I feel confident it will be made apparent that this field, though now almost deserted, is far from exhausted, and that capital, skill, and enterprise alone are requisite to prove the riches of the veins at a greater depth, and to restore Hill End to its former importance.

It affords me great pleasure to refer once more to the zeal and ability displayed by Mr. Wilkinson, and to bear testimony to the valuable services rendered by him during the year. Mr. Pittman, his first assistant, a gentleman of high attainments in his profession, has performed the work entrusted to him most satisfactorily. Mr. Lamont Young, the junior assistant, I regret to say, resigned his appointment at the end of the year, and thus the Department lost the services of an able geologist and metallurgist.

In consequence of the lamented death of that eminent geologist the Rev. W. B. Clarke, F.R.S., &c., &c., it was understood that his very valuable collection of minerals, his geological map of this Colony, and his library would be offered for sale, and therefore this Department opened negotiations for the purchase of them, the result being that the Rev. J. E. Tenison-Woods, F.G.S., &c., Mr. Wilkinson, F.G.S., and I were desired by the Minister for Mines, with the concurrence of the late Mr. Clarke's representatives, to examine and value them. Our valuation having been accepted, it is hoped the collection will soon be added to the museum of this Department, and that the map, under the direction of Mr. Wilkinson, will speedily be prepared for publication. The Wardens and other officers throughout the Colony have performed their duties with great efficiency, and have at all times exhibited a warm interest in the work of the Department. The Inspector of Mines has given the utmost satisfaction in the performance of his duties, and it is gratifying to find that only two serious accidents have occurred since the Regulations relating to the inspection of mines came into operation, in any of the mines to which they apply.

During the year locality maps have been prepared and published of the Barrington, part of the Tambaroora, Turon River, and Chambers Creek Gold-fields, and of the tin-fields in the parishes of Cope's Creek, Darby, Swinton, and Mayo. In addition to this, locality maps of the Yalwal Gold-field, the Vegetable Creek Tin-field (including the parishes of Strathbogie North, Strathbogie South, Tent Hill, Scone, Hamilton, Arvid, Brown, Bundar, and part of Wellington Vale, Strachan, Wellington North, Paradise North, Athol, Astley, and Gordon), and part of the Cope's Creek Tin-mining District have been prepared, or partly prepared, during the year. The preparation of these maps represents a very large amount of work, and reflects great credit on the officers of the Charting Branch of this Department, and these maps will be of the utmost value in the event of a revival in tin-mining.

The reports hereto annexed of the several officers show that the effects of the long drought were felt during the earlier part of the year on most of the gold-fields, and on some of them a sufficient supply of water was not obtained till the year had nearly expired; and work at the tin and copper mines was retarded by reason also of the low price of those metals. Nevertheless, our output of copper, which was not affected by the drought, exceeds that of any previous year, and the same may be said of our output of coal and shale. In spite of the serious drawbacks upon the mining industry—droughts and low prices—the aggregate value of the minerals won during 1878 exceeds the decennial average, according to the annexed statement, by £43,245.

RETURN showing the quantity and value of Gold, Shale, Copper, Tin, Silver, Iron, Antimony, and Lead produced in the Colony of New South Wales during the last ten years.

Year.	Gold.		Coal.		Shale.		Copper.		Tin.		Silver.		Iron.		Antimony.		Lead.		Mixed Minerals.		Total.
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
	Ozs.	£	Tons.	£	Tons.	£	Tons	£	Tons.	£	Ozs.	£	T'ns	£	T. c.	£	T. c.	£	T'ns	£	£
1869	251492	974149	919774	346146	7500	18750	2084	76675	....	....	753	190	..	....	....	..	....	..	..	..	1415919
1870	240858	931016	868564	310836	8580	27570	1000	65731	....	....	13868	3801	..	....	....	..	....	..	..	..	1344954
1871	323610	1250485	898784	316340	14700	34050	1444	88876	....	....	71312	18681	..	....	31 0	560	....	..	..	..	1708992
1872	425130	1643582	1012426	396198	11040	28700	1452	105888	896	47703	49545	12663	..	....	0 13	5	....	..	..	..	2234739
1873	301785	1305175	1192862	665747	17850	50475	2846	239102	4571	334436	66908	16278	..	....	27 12	210	....	..	..	..	2701423
1874	270823	1040329	1304567	790224	12100	27300	4160	325140	6219	484322	78027	18880	..	†15434	12 15	122	....	..	..	..	2701751
1875	230883	877604	1329729	819430	6197	15500	3677	301690	8080	561311	52553	12794	40	502	142 0	5000	....	..	..	..	2593921
1876	167412	613190	1319918	803300	15998	47994	3275	249978	6958	439638	69179	15456	2680	13399	40 0	140	*67 0	1392	..	..	2184487
1877	124111	471418	1444271	858998	18963	46524	4513	324226	8054	508540	31409	6673	2600	7600	69 12	1131	20 12	325	231	7725	2233160
1878	119665	430033	1575497	920936	24371	57211	5219	345158	7210	395822	60563	13291	900	6666	64 0	1964	5 0	258	77	1082	2172421
	2515769	9627071	11866392	6234155	137299	354074	29670	2122464	41988	2771772	494207	118716	6220	43601	387 12	9132	92 12	1975	308	8807	21291767

*** These figures represent the quantity raised during 1876 and previous years. † These figures represent the value of iron raised prior to the year 1875 ; quantity not known.**

GOLD.

It is gratifying to find that the depression which has so long affected the gold-mining industry is gradually becoming less, and that there are reasonable grounds for believing that with the aid of a moderate amount of capital and suitable appliances some of our gold-fields would yield such returns as would quite revive this important industry—an industry which has done more than any other to attract population to these Colonies. The importance of gold-mining is demonstrated by the fact that the value of the gold won in the Australian Colonies, including New Zealand, to the end of 1878, amounts to about £275,000,000 sterling.

By reference to the reports of the gold-fields officers, it will be seen that the Warden of the Bathurst District estimates that 200 additional miners could be profitably employed at Trunkey. The Warden at Orange is of opinion that if skill and capital were employed at Ophir the results would be surprising. The Warden at Carcoar says that though few miners are at work, the yield of gold exceeds that of the preceding year by 50 per cent. The Warden at Hill End says the alluvial deposits in the basalt hills at Muckerawa appear to be payable. These deposits are very extensive in various parts of the Colony, and in very few places have they been tested, though there appears to be a desire now to test them in a few localities. The Warden at Gulgong says thousands of acres known to be auriferous are left unproductive for want of capital to work the deep leads. The Warden at Forbes is of opinion that the works of the South Lead Company will cause the whole of the upper portion of the South Lead to be reworked and the lower portion to be traced and opened up, because the Company's operations will show what can be done by means of improved appliances and modes of working deep and wet ground. The Warden at Armidale states that very important works are being carried on at the Rocky River Gold-field, with a view to re-open deep leads which have long been abandoned on account of the quantity of water. The Long Tunnel Company are cutting a tunnel through very hard granite country, for the purpose of draining an extensive tract of auriferous ground; and the Bullion Company are sinking a shaft, with the aid of machinery, for the purpose of working a deep wet lead. The Warden at Bingera refers to the want of capital for the development of the deposits in that district. The Warden at Tenterfield refers to the extensive works in progress for the purpose of bringing water to a part of the Timbarra Gold-field proposed to be operated upon by hydraulic sluicing. The reports of the several Mining Registrars are on the whole indicative of improvement. Mention is made of large quartz reefs at Ironbarks, and at Yalwal especially, which ought, if properly worked, to yield very handsome profits ; also of extensive alluvial and cement leads at Muckerawa, Nundle, &c., and extensive deposits at the Dromedary.

As shown by the able report of the Geological Surveyor upon the Barrington Gold-field, there is an immense extent of country in that part of the Colony of a similar formation to that at Back Creek and the Bowman River, where so many gold-bearing quartz veins have already been found. This country presents an extensive and promising field for exploration, auriferous veins having been discovered (wherever search has been made) at various points long distances apart. And as the riches of those veins already discovered become developed prospectors will doubtless be tempted to extend their operations, and thus at no distant date this vast field may be fully explored and afford profitable employment to a much larger number of miners than is at present to be found throughout this Colony.

That so rich a field as the Barrington should have produced so small a quantity of gold is due almost entirely to the want of a permanent water supply and of adequate and efficient reducing and gold-saving appliances. The effect of this want would be forcibly shown if a correct return could be obtained of the quantity of gold that has been extracted from the quartz by the process known as dollying, *i.e.*, crushing by hand. Had there been upon the field ample means of crushing all the quartz that could have been raised, there would, I believe, have been very few cases of non-work to complain of, and there would have been a very material increase to our yield of gold for 1878.

There are doubtless on all gold-fields, and probably always will be, some persons who will not work—preferring to hold their claims in the hope of profiting by the labour of others—but the large majority of gold-miners are only too ready to work if they can see a prospect of getting gold. Unless the stone is enormously rich it will not pay for crushing by hand ; and if there is no crushing plant, or no water available, it is obviously useless to keep on raising quartz, even if they have the requisite means, which unfortunately few of our miners have. It is quite clear that if work were carried on vigorously and continuously upon all the mines at Back Creek only a very small proportion of the stone could be crushed with present appliances, and thus in very many cases the idleness complained of is enforced. Back Creek, though ill supplied, has some crushing power, but on the Bowman, Coolongolook, and other surrounding fields there is none at all, and consequently the process of development is extremely slow.

With restored confidence in mining enterprise we may hope to see these fields supplied with batteries to crush the quartz, apparatus to save the gold, roads from the mines to the batteries, and an abundant supply of water for mining as well as for domestic purposes.

No one really interested in the progress of this important industry would wish to see a revival of the excitement which prevailed some six or seven years since, because at such times speculation is rife, and heavy losses are invariably incurred, and these are usually followed by unjustifiable want of confidence in legitimate mining pursuits; but it is very desirable that when such a field as the Barrington has been opened and fairly tested, the requisite capital for its development should be forthcoming. If such confidence be established we may fairly expect soon to obtain such results from the Barrington mines, already proved, as will attract miners to the field; and as the number of miners increases they will be forced to extend their operations, and in so doing will open up new veins from time to time until this extensive field shall have been fully developed.

Considering the extent of the auriferous deposits in this Colony (estimated at 35,000 square miles), it is quite evident that the number of miners (7,074) engaged in gold-mining, and the amount of capital (£306,532) invested in gold-mining plant, is altogether inadequate. In the absence of proper appliances, the few miners we have may be said to have performed wonders; but there is a limit beyond which they, unaided by suitable machinery, cannot go. Hence it is that in most cases our larger quartz veins and deeper alluvial deposits have been neglected, because, to be worked profitably, they must be worked systematically on a large scale, aided by all the labour-saving arrangements and appliances available.

It is true that extensive works are in operation on some few of our gold-fields, but they are barely sufficient to show what can be done by good management and well-directed enterprise.

With a view to encourage those engaged in developing the auriferous deposits of the Colony, the Parliament voted the sum of £5,000 to aid prospectors. The regulations under which the money was to be distributed provided for the appointment of a Board (consisting of the Under Secretary for Mines, the Geological Surveyor, and a Warden), whose duty it was to visit each of the several districts from which applications for aid had been received, and to inquire into and report upon the merits of the several schemes for the carrying out of which the aid was sought. The duty cast upon this Board was a most difficult one to discharge satisfactorily, because the applications for aid far exceeded the amount available, and because a large number of the proposed works, though deserving of support, were not such as could in terms of the vote be assisted.

The Board at once recognized the impossibility of guarding altogether against the expenditure of some portion of the vote upon works which would not result in the discovery of payable deposits, but it was careful to select such sites as presented reasonable prospects of success, and endeavoured to secure the performance of a fair amount of work for the money expended, and also that the labour should be so directed as to thoroughly test the site selected. The greater part of the works in respect of which aid was granted are still in progress, and therefore it is not yet possible to form any estimate of the result that will be obtained from the expenditure of the vote, but some of the schemes certainly give promise of opening up deposits which should afford employment to a large number of miners.

I cannot refrain from expressing my appreciation of the services of the Geological Surveyor and the several Wardens upon this Board. The scientific knowledge of the former and the local knowledge of the latter were invaluable, and if success attend the labours of the Board, much of the credit will be due to these gentlemen.

The tables annexed to this Report show that the number of miners engaged in gold-mining during the year 1878 was 7,074, and that the quantity of gold won during the year was 119,665ozs. (being 107,347 ozs. sent into the Mint, and 12,317 ozs. exported without passing through the Mint), valued at £430,033. Dividing the quantity of gold by the number of miners gives as the result of each miner's labour, 16oz. 18dwt. 7·7grs. of gold, being a decrease upon the result obtained during the preceding year; and dividing the value of the gold won by the number of miners employed, gives as the earnings of each miner for the year, £60 15s. 9¾d. In considering this result, it must be remembered that until quite late in the year the effects of the drought were severely felt on most of the gold-fields, and on very few could the miners obtain sufficient water to prosecute their enterprises, consequently they were idle or followed some other vocation during a great part of the year. Moreover, large numbers of miners were attracted to the Barrington Gold-fields, where, with very few exceptions, they were engaged in prospecting for veins, or opening out their mines, or were prevented by reason of the scarcity of water, or insufficiency of crushing power, from extracting the gold from their quartz. And it is quite possible that many miners who removed from other gold-fields to the Barrington during the latter part of the year have been included in two returns, namely, in the return furnished from the district where they were employed during the early part of the year, and the return of miners at the Barrington at the end of the year. Thus the aggregate number of miners may have been estimated too high, and the earnings of each miner too low.

The following table, compiled from information kindly furnished by R. Hunt, Esq., F.G.S., the Deputy Master of the Royal Mint, shows a decrease in our gold yield during the past year, as compared with that of 1877, equal to 14,245 ounces :—

QUANTITIES of Gold the produce of New South Wales received into the Royal Mint, Sydney, during 1877 and 1878 compared.

District.	Division.	1877.	1878.	Increase.	Decrease.
		ozs.	ozs.		
Bathurst	Bathurst	4,124·80	2,790·77	....	1,334·03
	Carcoar	3,184·10	4,666·35	1,482·25	....
	Orange	6,937·62	3,510·76	....	3,426·86
Tambaroora and Turon	Hill End	18,165·80	11,583·89	....	6,581·91
	Tambaroora	144·50	....	....	144·50
	Sofala	5,462·06	4,680·81	....	781·25
	Stony Creek	2,275·48	2,021·87	....	253·61
Mudgee	Mudgee	5,838·76	5,822·28	....	16·48
	Gulgong	11,402·82	6,076·82	....	5,326·00
	Hargraves	2,029·45	1,493·25	....	536·20
	Wellington	2,928·77	3,008·02	79·25	....
Lachlan	Parkes	9,257·70	5,077·47	....	4,180·23
	Forbes	193·91	211·47	17·56	....
	Grenfell	1,206·56	....	....	1,206·56
	Young	977·11	....	....	977·11
Southern	Goulburn	222·63	....	....	222·63
	Braidwood	6,372·58	7,864·32	1,491·74	....
	Araluen	3,414·01	4,364·48	950·47	....
Tumut and Adelong	Adelong	12,174·93	10,146·64	....	2,028·29
	Tumut	1,979·59	1,062·07	....	917·52
	Yass	17·29	15·47	....	1·82
	Tumbarumba	19·57	....	....	19·57
	Wagga Wagga	176·08	1,067·88	891·80	....
	Gundagai	43·17	170·72	127·55	....
	Cooma	987·34	344·50	....	642·84
	Kiandra	224·69	....	....	224·69
Peel and Uralla	Armidale	1,241·45	767·81	....	473·64
	Rocky River	596·30	835·32	239·02	....
	Nundle	721·06	....	....	721·06
	Tamworth	1,402·15	3,688·00	2,285·85	....
	Scone	16·27	....	....	16·27
Localities unknown	....	17,854·83	26,077·00	8,222·17	....
	Total	121,593·38	107,347·97	15,787·66	30,033·07

SUMMARY.

District.	1877.	1878.
Bathurst	14,246·52	10,967·88
Tambaroora and Turon	26,047·84	18,286,57
Mudgee	22,199·80	16,400·37
Lachlan	11,635·28	5,288·94
Southern	10,009·22	12,228·80
Tumut and Adelong	15,622·66	12,807·28
Peel and Uralla	3,977·23	5,291·13
Unknown	17,854·83	26,077·00
	121,593·38	107,347·97

The following table shows the quantity and value of gold exported during 1878. For this information I am indebted to the Hon. Geoffrey Eagar, the Under Secretary for Finance and Trade :—

EXPORTS—GOLD.—1878.

Dust.		Bars.		Auriferous Quartz.		Total.	
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
ozs.	£	ozs.	£	pkgs.	£	ozs.	£
1,154	4,429	10,851	41,613	122	1,250	12,317	47,292

From this return it will be seen that the value of gold exported during 1878 exceeds that of 1877 by £35,075.

The following table shows the quantities of gold won in the several Mining Districts, according to the returns furnished by the Mining Registrars, as compared with the quantities sent to the Mint :—

RETURNS of Gold for 1878 from Mint and the Mining Registrars compared.

	Mint.	Mining Registrars.	Excess.	Deficiency.
	ozs.	ozs.	ozs.	ozs.
Bathurst	10,968	8,309	2,659	....
Tambaroora and Turon	18,286	20,923	....	2,637
Mudgee............	16,400	8,897	7,503	....
Lachlan	5,289	10,059	....	4,770
Southern	12,229	14,128	....	1,899
Tumut and Adelong	12,807	17,184	....	4,377
Peel and Uralla	5,291	16,358	....	11,067
New England and Clarence	....	3,408	....	3,408
Locality unknown	26,077	....	26,077	....
			36,239	28,158
			28,158	
The quantity sent to the Mint exceeds the quantity returned by Mining Registrars by			8,081 ounces.	

The following table shows the quantities of gold won during 1878 in the several Mining Districts according to the returns furnished by the Mining Registrars, and also shows a decrease as compared with the yield for 1877, equal to 22,657 ounces. But it is, I regret to say, quite evident that these returns are less complete than were those of 1877, because the quantity of gold sent to the Mint and exported exceeds the quantity returned by the Mining Registrars by 20,398 ounces.

I am, however, aware that these officers experience very great difficulty in reaching all the scattered parties of miners in their several divisions, and in obtaining from those they can reach full and reliable information of the quantities of gold raised, and therefore I do not ascribe the incompleteness of the returns to lack of zeal on the part of these officers. If these returns could be made complete, I am convinced they would represent a larger quantity of gold than the Mint and Customs returns taken together.

MINING Registrars' Returns of Gold for 1877 and 1878 compared.

	1877.	1878.	Increase.	Decrease.
	ozs.	ozs.	ozs.	ozs.
Bathurst	12,477	8,309	....	4,168
Tambaroora and Turon	26,760	20,923	....	5,837
Mudgee	24,157	8,897	....	15,260
Lachlan	14,457	10,059	....	4,398
Southern	12,787	14,128	1,341	....
Tumut and Adelong	19,799	17,184	....	2,615
Peel and Uralla	7,927	16,358	8,431	....
New England and Clarence	3,559	3,408	....	151
	121,923	99,266	9,772	32,429
			Less Increase...	9,772
			Decrease in yield for 1878...	22,657

The following table shows the results obtained from the treatment of certain parcels of wash-dirt from alluvial mines in some of the districts, but these also are not so full as former returns. From some districts, in which are most important alluvial mines, no returns have been obtained, probably because in consequence of the scarcity of water during part of the year less dirt than usual has been treated, and the owners have not cared to furnish details of an unusually small output. This is to be regretted, seeing that the average yield obtained from large quantities of alluvium raised in all parts of the Colony gives data which is instructive and valuable alike to the miner and the capitalist. From the following table no conception can be formed by persons unacquainted with our gold-fields of the extensive operations carried on at Adelong, Araluen, Brown's Creek, and some few other places, from which returns in detail have not been obtained :—

COMPARATIVE statement of average yields from Alluvial Mines for 1877-8.

1877.				1878.			
District.	Quantity.	Average per Ton.	Yield of Gold.	District.	Quantity.	Average per Ton.	Yield of Gold.
	Tons.	ozs. dwts. grs.	ozs. dwts. grs.		Tons.	ozs. dwts. grs.	ozs. dwts. grs.
Bathurst	21,625	0 2 7·58	2,504 0 0	Bathurst	23,715	0 3 4·02	3,756 5 0
Tambaroora & Turon	1,674	0 3 13·44	297 19 16	Mudgee	1,610	0 0 12·00	40 5 0
Mudgee	1,160	0 3 0·00	174 0 0	Lachlan	17,787½	0 4 4·79	3,735 3 14
Lachlan	33,078	0 3 21·62	6,452 1 0	Southern	27,410	0 0 17·67	1,009 2 12
Southern	143,309	0 0 5·31	1,587 17 11				
Total	200,846	0 1 2·32	11,015 18 3	Total	70,522½	0 2 10·13	8,540 16 2

From the above table it will be seen that the average yield per ton is unusually high, but this is doubtless due to the fact that the results of some of our principal mines where large quantities of comparatively poor dirt is washed are not included. It is also no doubt to some extent due to the fact that owing to the scarcity of water during part of the year sluicing operations have in many places been retarded or altogether suspended, and only the better quality of dirt has been treated.

The following table shows the average yield per ton from parcels of quartz treated in each of the Mining Districts, and although the quantities in that table represent only a very small proportion of the stone crushed during the year, still the parcels may, I think, be regarded as fairly representing the quality of our veins :—

COMPARATIVE statement of average yields from Quartz Mines for 1877–8.

1877.				1878.			
District.	Quantity.	Average per Ton.	Yield of Gold.	District.	Quantity.	Average per Ton.	Yield of Gold.
	Tons cwt. qrs.	ozs. dwts. grs.	ozs. dwts. grs.		Tons cwt. qrs.	ozs. dwts. grs.	ozs. dwts. grs.
Bathurst	1,330 0 0	1 14 23·09	2,325 0 0	Bathurst	2,271 0 0	0 11 14·36	1,317 0 0
Tambaroora & Turon	6,714 10 0	1 9 4·62	9,800 18 8	Tambaroora & Turon	8,667 0 0	0 10 18·93	4,675 8 12
Mudgee	5,588 0 0	0 8 13·12	2,388 0 0	Mudgee............	2,245 0 0	0 12 0·00	1,347 0 0
Lachlan	7,365 5 0	0 9 10·49	3,475 7 11	Lachlan	1,543 0 0	0 10 19·64	834 13 0
Southern	645 0 0	0 16 18·38	540 12 20	Southern	2,022 5 0	0 15 3·74	1,532 10 0
Tumut and Adelong	6,060 10 0	1 2 1·95	6,691 4 0	Tumut and Adelong	6,787 8 0	1 8 9·07	8,070 9 20
Peel and Uralla	337 0 0	2 19 8·83	983 10 0	Peel and Uralla	2,385 18 0	3 5 20·71	7,888 18 0
New England and Clarence	214 0 0	0 8 14·24	91 19 0	New England and Clarence..........	79 0 0	2 8 18·53	192 13 0
Total......	28,254 5 0	0 18 14·73	26,296 6 15	Total......	26,000 11 0	0 19 5·73	25,858 12 8

Some Companies at Adelong and Hill End are still engaged in testing the quartz veins at depths varying, at the former place, between 800 and 900 feet, and at the latter place between 700 and 800 feet, and at both places the indications are encouraging.

These Companies are entitled to the highest praise for their energy and enterprise, because if their labours be as successful as they deserve, they will confer a material benefit upon the mining community, by proving the existence of gold-bearing stone at depths not hitherto reached in this Colony.

During the year the following assays were made by Mr. W. A. Dixon, F.C.S., F.I.C.:—

No. 1. Mispickel with quartz, from Marulan.
Gold............... 9 dwts. 5 grs. per ton. Silver............ 3 dwts. 5 grs. per ton.

No. 2. The same, from the same locality.
Gold............... 8 dwts. 5 grs. per ton. Silver............ 5 dwts. 0 grs. per ton.

No. 3. Auriferous brown-coloured earth and shale, &c., from Box Ridge, Hill End.
Gold............... 15 ozs. 2 dwts. 19 grs. Silver, traces.

No. 4. Quartz, with mispickel, from Moruya.
Gold... 1 oz. 14 dwts. 10 grs. per ton. Silver............ 17 dwts. 14 grs. per ton.

No. 5. Quartz, with mispickel, from Slippery Creek, near Oberon.
Gold... 2 ozs. 7 dwts. 10 grs. per ton. Silver............ 19 dwts. 19 grs. per ton.

No. 6. Waterworn nodules of quartz, containing specks of iron pyrites, from New Guinea, sent to be assayed for gold and silver, contained 2 dwts. per ton of both metals together, the button being almost white.

No. 7. Black sand from New Guinea, largely composed of magnetite, contained—
Gold.. 3 dwts. 5 grs. per ton.

No. 11. Quartz, contained galena, copper pyrites, and traces of stibnite, amounting in all to 15·8 per cent., chiefly galena.
Gold... 47 ozs. 16 dwts. 5 grs. per ton. Silver, traces.

No. 12. Found between Mudgee and Wallerawang, contained copper pyrites and galena, and yielded—
Gold and silver .... 15 grs. per ton. Copper............ 5·5 per cent.

No. 13. Consisted chiefly of iron and arsenical pyrites, with traces of lead, antimony, zinc, silver, and gold.

No. 15. Magnetite, from Clear Creek, Peel River, contained—
Gold and silver.. 2 dwts. 5 grs. per ton.

No. 16. From Shoalhaven, sent to be tested for gold and silver and mercury, of which it contained none. Consisted of ferric and magnetic oxide of iron, with a small quantity of manganese dioxide, mixed with earthy matter.

No. 18. Surface quartz, stained with oxide of iron, from Bungendore, contained—
Gold...... 0 ozs. 6 dwts. 5 grs. per ton. Silver............... 1 dwt. 5 grs. per ton.

No. 21. Mispickel, from Ournie, contained—
Gold...... 2 ozs. 0 dwts. 10 grs. per ton. Silver......... 1 oz. 1 dwt. 5 grs. per ton.

This sample yielded by amalgamation, without roasting—
Free gold...... 1 oz. 19 dwts. 0 grs. per ton. Silver......... 5 dwts. 0 grs. per ton.

No. 22. Decomposed quartz, much stained with ferric oxide, from near Goulburn. Sent to be tested for gold, of which it contained a trace less than 5 grs. per ton.

No. 23. Quartz, with arsenical pyrites, from Isabella Reef, Ournie, contained—
Gold...... 4 ozs. 0 dwts. 5 grs. per ton. Silver, traces.

No. 26. Quartz, from the Star of Peace G. M. Company, Hill End, from a depth of 700 feet. The specimen was reported to be an average piece of stone, and was studded with minute specks of gold contained—
Gold...... 32 ozs. 19 dwts. 14 grs. per ton. Silver, traces.

No. 27. Gray quartz, containing finely disseminated pyrites, from Glen Innes, contained—
Gold...... 0 ozs. 0 dwts. 5 grs. per ton. Silver...... 0 ozs. 16 dwts. 0 grs. per ton.

No. 28. Quartz and slate, containing iron and arsenical pyrites, from Barrington, contained—
Gold...... 0 ozs. 4 dwts. 5 grs. per ton. Silver...... 0 ozs. 2 dwts. 10 grs. per ton.

No. 29. Quartz with talc, containing iron and arsenical pyrites, from near Peelwood, contained—
Gold and silver .... 0 ozs. 1 dwt. 5 grs. per ton.

No. 30. Grey steatite, with iron and arsenical pyrites, from near Peelwood, contained—
Gold and silver, 0 ozs. 2 dwts. 5 grs. per ton. Copper, traces.

No. 31. Slate, with iron and arsenical pyrites, from near Peelwood, contained—
Gold and silver, 0 ozs. 3 dwts. 0 grs. per ton. Copper........... 0·41 per cent.

No. 32. Quartz, with copper and iron pyrites, from Little River, Abercrombie, contained—
Gold and silver... 0 oz. 2 dwts. 19 grs. Copper..................... 4·71 per cent.

With a view to direct attention to the waste from our gold-mines, and in the hope that some means may be devised of utilizing material containing such a large percentage of gold and silver, I submit the following tables :—

Tailings. 1st table, assays made by Mr. Dixon, F.C.S., F.I.C.

No. 9. Pyritous tailings from Ironbarks (Beehmer's machine). Brownish coloured sand, containing iron pyrites, contained—
Gold...... 5 ozs. 13 dwts. 5 grs. per ton. Silver, traces.

No. 10. Quartz tailings, from Gulgong, with pyrites, contained—
Gold .... 4 ozs. 15 dwts. 5 grs. Silver, traces.

No. 14. Tailings, sand from Grenfell Consols Co., contained—
Gold .... 2 dwts. 20 grs. per ton. Silver .... 2 dwts. 5 grs. per ton.

No. 17. Iron pyrites, from Pretty Gully, near the head of the Clarence River, contained—
Gold......... 10 dwts. 10 grs. per ton. Silver, traces.

No. 24. Tailings from the above contained—
Gold ... 2 ozs. 8 dwts. 0 grs. per ton.

No. 25. Blanketings from the same—
Gold...... 5 ozs. 0 dwts. 10 grs. per ton.

Table showing the results of analysis of samples of quartz tailings and other waste gold-bearing products, made by Professor Liversidge, F.C.S., F.G.S., &c., &c., for this Department.

Quartz tailings.

No.	Locality.	Gold per ton.			Silver per ton.			Remarks.
		ozs.	dwts.	grs.	ozs.	dwts.	grs.	
43	Mitchell's Creek, near Bathurst ..	0	7	4	traces			Composed of rather coarse particles of quartz, mixed with loose powdery oxide of iron. This sample has the appearance of having been calcined, the iron oxide is therefore probably derived from the decomposition of pyrites
44	Consols' Engine, Grenfell	1	6	18	1	4	4	Of a pale brown colour
45	Mathison's Engine, Grenfell.. ..	0	3	22	traces			Quartz grains mixed with a buff-coloured powder
46	Slee's Engine, do.	0	3	22	traces			Nearly white in colour
47	Victoria Mill, do.	0	1	7	traces			Do.
48	Vaughan's Engine, do.	1	2	22	0	0	14	Of a yellowish brown colour
49	Kirkpatrick's Engine, do.	0	9	19	traces			Mixed with small agglutinated lumps of iron oxide
50	Nerrimunga, county of Argyle ..	0	4	18	traces			Of a greenish colour, mixed with pyrites
51	Nerrimunga, do.	0	7	19	0	13	2	Of a gray colour
52	Nundle, county of Parry	0	6	10	traces			White in colour
54	Hill End	0	1	7	traces			Calcined, mixed with iron oxide
55	Do.	0	1	7	traces			Of a brown colour
56	Do.	0	2	14	traces			Roasted, of a brown colour
57	Do.	0	3	6	traces			Of a brown colour
59	Do.	0	2	14	traces			Calcined, mixed with much red oxide of iron
60	Clear Creek	0	9	19	11	11	5	White quartz, mixed with other substances, giving the tailings a pale brown colour
61	Do.	0	8	11	12	18	18	Pale brown colour, much the same as No. 60.
62	Tumberumba	0	5	21	traces			White in colour, the quartz particles are very transparent, and have a very vitreous lustre, therefore very glassy looking
63	Dragon Gold Mining Co., Hill End..	0	8	22	traces			Of a brown colour
66	Excelsior Machine, Tambaroora ..	0	3	6	traces			Roasted, of a pinkish colour
67	Red Hill Machine, do...	0	7	4	traces			White in colour
68	Independent Machine, do.	0	0	15	traces			Light brown colour, mixed with a few uncrusted lumps
69	Sydney and Tambaroora Machine, do.	0	5	5	traces			Of a pale brown colour
73	Britannia Reef, Forbes	0	1	23	traces			Yellow brown colour
74	Strickland's Reef, do...	0	16	23	0	6	11	Finely divided, brown in colour
75	Williams's Battery, Adelong.. ..	0	3	22	traces			Nearly white in colour
76	Do.	0	1	7	traces			Do.
78	Braidwood	0	8	11	traces			Calcined
79	Burne's Machine, Wiseman's Creek, Oberon	0	9	3	0	12	9	Of a brown colour
80	Lambert and Davies's do. do. ..	0	2	14	traces			
81	Whelan's Machine, Glendwi, Oberon	0	0	15	traces			In fine state of division, of a light brown colour
82	Long Flat, Major's Creek	0	1	7	traces			
83	Big Hill, do.	0	1	7	traces			Brown in colour
85	Hargraves	0	1	7	traces			Coarse-grained, calcined
86	Belmore	0	6	10	0	19	17	Almost white in colour
88	Tuena	1	0	21	0	16	3	Calcined, of an ordinary brown colour
89	Do.	0	3	6	traces			Of a greenish gray colour, contains pyrites, and a few rounded pebbles
90	Do.	0	13	17	traces			Milky-white colour
91	Tower Hill Co's Battery, Dalmorton, Little River	0	1	23	traces			White quartz, mixed with a gray powder, probably derived from slate casing or matrix
92	Lombardy Co's Battery, Solferino ..	0	7	20	traces			Of a brown colour
93	Band of Hope Co., do...	0	0	15	......			Of a very pale brown colour
94	Enterprise Battery, Cundlebung, near Dalmorton, Little River ..	0	7	4	traces			
95	Faugh-a-Ballagh Reef, Oberon ..	1	15	22	0	7	4	Mixed with pyrites
96	King of the West, Trunkey	0	4	13	traces			Of a gray colour, from a depth of 50 to 120 feet
97	Do., do.	0	12	9	traces			A yellow-brown powder, from the discharge shoot, after passing through the amalgamating barrels. Depth, 500 feet
98	Lady Bowen Machine, do.	0	1	23	traces			Very pale brown colour, from depth of 500 feet
99	Trunkey Creek Quartz Mining Co., Trunkey	0	1	7	traces			Of a light brown colour. Depth, 300 feet

Other waste gold-bearing products.

No.	Locality.	Gold per ton.			Silver per ton.			Remarks.
		ozs.	dwts.	grs.	ozs.	dwts.	grs.	
53	Nundle, county of Parry	0	1	7		traces		Of a greenish colour, containing friable lumps (sludge)
58	Hill End	0	0	15		traces		Containing light coloured subangular argillaceous pebbles mixed with a little quartz (sludge)
64	Dragon Gold-mining Company, Hill End	0	7	4	0	13	2	Colour dark brown (blanketing)
65	Do.	0	1	7		traces		A mass of soft white pipeclay (waste)
70	South Lead, Forbes	0	1	7		traces		Yellowish-brown colour agglutinated into lumps (sludge)
71	Victoria Lead, Forbes..	0	4	13		traces		Clay coloured, lumpy, much the same as the last (sludge)
72	Mathieson's Lead, Forbes	0	6	10		traces		Red-coloured, loose clay-like material (sludge)
77	Braidwood	0	3	22		traces		Principally clay mixed with roots of plants, and containing fragments of quartz leaders (sludge)
84	Spring Creek, Major's Creek.. ..	0	17	15	1	12	0	Apparently a calcined pyrites, a dark chocolate brown powder
87	Cowra	0	0	15				An argillaceous sharp gravel, *i.e.*, the fragments are not water-worn (sludge)

If some simple and inexpensive method could be found of extracting the gold from the tailings, sludge, &c., of which large quantities have accumulated and are lying waste on our gold-fields, or failing that, if a market could be found for such material, the earnings of our miners would be considerably increased, a new field of industry would be opened up, and much of the waste that is now carried away by the waters of creeks or rivers would be conserved. It is to be feared that in many cases the cost of carriage will be an obstacle in the way of securing a market for the waste from our gold mines, but as each year increases the facilities of transit, the time may not be far distant when our waste heaps will possess a commercial value; and therefore it is most desirable that the practice of allowing the tailings, &c., to be carried off in creeks and rivers be discontinued, because by that means not only is the gold irrecoverably lost, but the creeks and rivers are injured.

COAL.

The quantity of coal obtained from our seams prior to the year 1829 cannot now be ascertained from any public records, and no complete returns thereof, so far as I can learn, have been published, but from the beginning of that year to the end of 1878 our output of coal amounts to 19,056,694 tons, valued at £10,057,992 18s. 2d. And, as will be seen by reference to the tables in my previous Reports, this branch of mining industry has progressed steadily from an output of 780 tons in 1829 to 1,575,497 tons in 1878. It affords me great pleasure to record the fact, shown by the following table, that our output for 1878 exceeds that of the previous year by 131,226 tons, valued at £61,937 19s. 2d., and exceeds the average of the previous ten years in quantity by 450,985 tons, and in value by £347,834.

TABLE showing the quantities and average value per ton of Coal exported to Intercolonial and Foreign Ports respectively, the quantity of Coal consumed in this Colony, and the average price per ton of the total output of the Collieries, from 1858 to 1878 inclusive.

Years.	Exports to Intercolonial Ports.			Exports to Foreign Ports.			Total Exports.			Home consumption.	Total Output and Value.		
	Quantity.	Average per ton.	Value.	Quantity.	Average per ton.	Value.	Quantity.	Average per ton.	Value.		Quantity.	Average per ton.	Value.
	Tons.	£ s. d.	£	Tons.	£ s. d.	£	Tons.	£ s. d.	£	Tons.	Tons.	£ s. d.	£ s. d.
1858..........	101,488	0 15 1·67	76,824	12,089	1 0 1·85	12,132	113,527	0 15 8·05	88,956	102,870	216,397	0 14 11·84	162,162 0 0
1859..........	129,586	0 14 6·67	94,312	44,349	0 17 5·27	38,672	173,935	0 15 3·49	132,984	134,278	308,213	0 13 3·14	204,371 0 0
1860..........	140,183	0 14 10·85	104,471	93,694	0 16 11·10	79,290	233,877	0 15 8·57	183,761	134,985	368,862	0 12 3·36	226,493 0 0
1861..........	157,278	0 15 2·25	119,433	50,502	0 16 5·37	41,532	207,780	0 15 5·92	160,965	134,287	342,067	0 12 9·52	218,820 0 0
1862..........	195,427	0 15 0·55	147,019	113,355	0 17 4·34	98,408	308,782	0 15 10·75	245,422	167,740	476,522	0 12 9·73	305,234 0 0
1863..........	213,909	0 13 8·40	146,532	84,129	0 17 6·10	73,649	298,038	0 14 9·30	220,181	135,851	433,889	0 10 10·66	236,230 0 0
1864..........	283,539	0 10 3·74	146,199	88,927	0 14 10·90	66,289	372,466	0 11 4·91	212,488	176,546	549,012	0 9 10·10	270,171 0 0
1865..........	292,664	0 9 11·83	146,129	90,304½	0 15 0·79	68,029	382,968½	0 11 2·20	214.158	202,556½	585,525	0 9 4·43	274,303 0 0
1866..........	344,194	0 9 2·98	159,175	196,711	0 14 4·53	141,413	540,905	0 11 1·37	300,588	233,333	774,238	0 8 4·44	324,049 0 0
1867..........	312,101	0 9 4·35	146,111	161,256	0 13 3·47	107,148	473,357	0 10 8·40	253,259	296,655	770,012	0 8 10·79	342,655 0 0
1868..........	329,052	0 9 5·76	155,975	218,984	0 12 5·29	136,226	548,036	0 10 7·96	292,201	406,195	954,231	0 8 9·08	417,809 0 0
1869..........	340,466	0 8 9·07	149,059	255,087	0 11 8·31	149,136	595,553	0 10 0·16	298,195	324,221	919,774	0 7 6·32	346,146 0 0
1870..........	335,564	0 8 6·02	142,656	242,825	0 10 3·57	125,025	578,389	0 9 3·07	267,681	290,175	868,564	0 7 3·54	316,836 0 0
1871..........	378,891	0 8 6·91	162,470	186,538	0 10 1·22	94,220	565,429	0 9 0·95	256,690	333,355	898,784	0 7 0·47	316,340 0 0
1872..........	394,052	0 8 8·11	170,947	275,068	0 9 11·46	136,914	669,110	0 9 2·42	307,861	343,316	1,012,426	0 7 9·92	396,198 0 0
1873..........	425,937	0 12 9·32	272,110	347,142	0 14 7·59	253,979	773,079	0 13 7·32	526,089	419,783	1,192,862	0 11 1·94	665,747 0 0
1874..........	467,583	0 13 8·30	320,119	405,442	0 15 4·76	312,128	872,980	0 14 5·81	632,247	431,587	1,304,567	0 12 1·37	790,224 0 0
1875....	518,853	0 13 7·77	354,074	408,154	0 15 6·64	317,409	927,007	0 14 5·84	671,483	402,722	1,329,729	0 12 3·89	819,429 17 2
1876..........	542,952	0 13 8·45	372,045	325,865	0 15 6·45	253,166	868,817	0 14 4·70	625,211	451,101	1,319,918	0 12 2·06	803,300 5 6
1877..........	563,757	0 13 8·64	386,740	351,970	0 14 10·81	262,237	915,727	0 14 2·08	648,977	528,544	1,444,271	0 11 10·74	858,998 8 2
1878..........	628,323	0 13 8·77	427,954	383,097	0 14 7·69	280,452	1,006,420	0 14 0·93	708,406	569,077	1,575,497	0 11 8·28	920,936 7 4
Total......	7,090,799	0 11 11·86	4,200,354	4,335,428½	0 14 0·70	3,047,449	11,426,182½	0 12 8·19	7,245,808	6,219,177½	17,645,360	0 10 5·35	9,216,452 18 2

From the above table it will be seen that although the average price per ton is a fraction higher than in 1877, the quantity of coal sent to intercolonial ports during 1878 exceeds that of 1877 by 59,566 tons.

This branch of the coal trade has increased year by year with great regularity, the increase abovementioned being the largest in any one year since 1864, when a very considerable reduction in the price, as compared with previous years, occurred.

The quantity sent to foreign ports during 1878 exceeds that of the preceding year by 31,127 tons, but the price per ton was a shade lower. Our trade with foreign countries has fluctuated considerably, the highest point having been reached in 1875, but since 1876 we have been recovering the ground lost during the last-named year, and another stride equal to that of last year will carry us beyond the highest point hitherto reached.

Our home consumption during 1878 exceeds that of 1877 by 40,533 tons, and is greater than that of any previous year.

According to the report of the Examiner of Coal Fields, there were thirty-three collieries under inspection during 1878, as against thirty-seven in the preceding year.

From the same report it appears that there were eight fatal accidents in 1878, as against seven in 1877, and fifteen non-fatal accidents last year, against twenty-one during the preceding year.

The reports of the Examiner of Coal Fields and of the Inspector of Collieries show that as a rule the quantity of air prescribed by the Act is sent into the mines, and that with few exceptions the circulation of the air is satisfactory.

From the number of accidents given above it would follow that during 1878 one life was lost for every 196,937 tons of coal raised, and one non-fatal accident occurred for every 105,033 tons of coal raised, whereas in 1877 one life was lost for every 206,324 tons of coal raised, and one non-fatal accident occurred for every 68,774 tons. And during the past year the number of fatal accidents was 1 in 601, and the non-fatal, 1 in 320 of the number of persons employed in the collieries, whereas during the preceding year the proportion was,—fatal accidents, 1 in 665, and non-fatal, 1 in 222 of the persons so employed.

The quantity of coal raised during 1878 for each person employed at the collieries is 327·54 tons, whereas in 1877 the quantity raised for each person so employed was 310·12 tons.

In my last Report I mentioned the fact that a Company had been formed for the purpose of boring with the diamond drill for coal at Newington, near Sydney. After reaching a depth of 1,312 feet, and when, from the indications, they might fairly expect shortly to meet with coal, they were compelled to suspend operations in consequence of a drift through which the drill had passed running in and choking the bore. It is, I understand, the intention of the Company to resume operations when the necessary arrangements have been completed, but in the meantime the diamond drill is being employed elsewhere.

During the year similar operations were commenced at Moore Park, Sydney, and on the property of the Honorable Thomas Holt, M.L.C., Botany, and at both places considerable progress has been made, but a sufficient depth to prove the coal seams has not yet been reached.

By the courtesy of Captain Smith, the Chairman of the Waratah Company, we are enabled to publish with this Report a number of interesting sections of our Northern Coal Fields, prepared by Mr. T. P. Moody.

The following analysis of samples of coal have been made during the year by Mr. Dixon, F.C.S., F.I.C.:—

COALS.

No. 68.

COAL.—From Berrima District.

Had a laminated structure, with bright layers, and was rather tender, breaking easily in small piecer.

Specific gravity 1·37,

	Analysis.	
Moisture	1·90	
Volatile hydrocarbons	21·17	Coke, 75·92.
Fixed carbon	57·67	
Ash	18·25	
Sulphur	1·01	
	100·00	

The coke was much swollen up, soft, and black-coloured, with a few bright specks.
The ash was grayish white, but from its large amount this coal would only be of value for local purposes.

No. 69.

COAL.—From Berrima District.

Rather dull, with very thin bright layers, along which it split readily.
Yielded a brown powder. Bituminous.

Specific gravity 1·56,

	Analysis	
Moisture	1·21	
Volatile hydrocarbons	19·95	
Fixed carbon	41·30	Coke, 77·86.
Ash	36·56	
Sulphur	·98	
	100·00	

Coke.—Much swollen up, and fairly lustrous and hard.
Ash.—White, but so large in quantity as to render the coal of little value.

No. 70.

COAL.—From same place.

Dull-coloured, bright layers entirely absent, gave a dark brown powder, darker than No. 69.

Specific gravity 1·51.

	Analysis.	
Moisture	1·26	
Volatile hydrocarbons	15·61	
Fixed carbon	48·34	Coke, 82·26
Ash	33·92	
Sulphur	87	
	100·00	

The coke was not much swollen, black-coloured and friable; ash, white. The same remark applies however to this coal as to No. 69.

No. 71.

Coal.—From Teralba, near Newcastle.
Semi-bituminous. Bright, with small conchoidal fracture, stained with oxide of iron.
Specific gravity, 1·35.

	Analysis.	
Moisture	4·65	
Volatile hydrocarbons	32·84	
Fixed carbon	52·68	Coke, 60·84
Ash	8·16	
Sulphur	1·67	
	100·00	

Coke.—Scarcely swollen, fairly bright, with small silvery excrescences, showed distinct prismatic fracture.
Ash.—Reddish, and somewhat friable.

No. 72.

Coal.—From same place.
Bituminous, generally bright, with a few narrow dull layers.
Specific gravity, 1·29.

	Analysis.	
Moisture	3·81	
Volatile hydrocarbons	30·22	
Fixed carbon	54·44	Coke, 62·96
Ash	8·52	
Sulphur	3·01	
	100·00	

Coal.—Bright and lustrous, very little swollen, dense, splits readily.
Ash.—Gray, not easily friable.

No. 73.

Coal.—From Minmi Colliery, Newcastle.
Bituminous, bright, with a few narrow dull streaks.
Specific gravity, 1·28.

	Analysis.	
Moisture	2·59	
Volatile hydrocarbons	33·87	
Fixed carbon	56·49	Coke, 62·10
Ash	5·61	
Sulphur	1·44	
	100·00	

Coke.—Bright, dense, with fused appearance, little swollen.
Ash.—Reddish, somewhat fusible.

No. 74.

Coal.—From new seam at Mittagong.

Contained dull and bright layers in about equal proportions; slightly soils the fingers. The bright lines of fracture were marked by numerous lense-shaped cavities 0·05 to 0·1 inch in greater diameter, generally filled with a brownish pulverulent carbonaceous matter. These were apparently the impressions and remains of seeds, and they showed traces of a dense cortical layer. The brown matter on heating glowed, emitted a smoky odour, and burned away completely.

Specific gravity, 1·486.

	Analysis.
Moisture	2·91
Volatile hydrocarbons	8·92
Fixed carbon	62·24
Ash	24·74
Sulphur	1·19
	100·00

This coal did not produce a true coke, a loose incoherent black powder being left.
Ash.—Grayish white, but much too large in amount.

No. 75.

Coal.—From near Jordan's Crossing.

Bituminous, rather dull, and somewhat brittle. The piece sent had a bright band running through the middle, and this band was very tender, breaking with slight pressure into rectangular fragments.

Specific gravity, 1·401.

	Analysis.	
Moisture	2·36	
Volatile hydrocarbons	28·27	
Fixed carbon	51·66	Coke, 67·52
Ash...	15·86	
Sulphur	1·85	
	100·00	

Coke.—Dense, hard, not much swollen, and having a silvery lustre.
Ash.—Pure, white, aluminous.

No. 76.

Coal.—From Wingecarribee River, near Berrima.

A hard bituminous coal, generally bright, but with reddish incrustation, the bright pieces breaking with decided choncoidal fracture.

Specific gravity, 1·355.

	Analysis.	
Moisture	1·41	
Volatile hydrocarbon	30·20	
Fixed carbon	53·15	Coke, 66·61
Ash	13·46	
Sulphur	1·78	
	100·00	

Coke.—Hard, slightly swollen, and fairly lustrous.
Ash.—White.

The following table, compiled by Professor Liversidge for the Annual Report of 1875, is republished for general information:—

Tabular View of the Percentage Composition.

Northern District Coal-field.

I.

No.	Name of Colliery.	Moisture.	Volatile Hydrocarbons.	Fixed Carbon.	Ash.	Sulphur.	Sp. gr.	Coke.
4	Russell's	1·84	44·09	49·95	2·70	1·41	1·274	52·65
5	Greta	2·25	39·21	54·41	2·72	1·41	1·287	57·13
1	Waratah	2·21	36·70	55·82	4·15	1·12	1·303	59·97
6	Wallsend	2·75	34·17	57·22	4·64	1·22	1·333	61·86
7	A.A. Co.'s Mine, Newcastle ...	2·20	32·60	57·52	5·35	1·33	1·297	62·87
3	Anvil Creek	1·74	41·10	47·90	7·80	1·46	1·323	55·70

The coals in the above table are arranged in order according to the amount of ash present—the first of the series containing the smallest, and the last the largest weight of ash. With the exception of the specimen from Anvil Creek, it will be noticed that the proportion of fixed carbon increases with the increase in the amount of ash—the proportions of volatile hydrocarbons naturally undergo a corresponding diminution.

Speaking generally, the coals which yield a large percentage of volatile hydrocarbons may be said to be the best adapted for the manufacture of gas.

It will also be at once apparent that the sp. gr. in most of the above cases affords a very good indication of the quality of the coal. As a general rule, ordinary coals which possess a high specific gravity yield a large proportion of ash.

TABULAR VIEW OF THE PERCENTAGE COMPOSITION.

Western District.

II.

No.	Name of Colliery.	Moisture.	Volatile Hydrocarbons.	Fixed Carbon.	Ash.	Sulphur.	Sp. gr.	Coke.
10	Vale of Clywdd	2·10	33·35	53·38	9·80	1·37	1·323	63·18
11	Lithgow Valley	1·95	34·18	52·34	10·12	1·41	1·329	62·46
9	Bowenfels	2·36	28·35	56·54	11·40	1·35	1·399	None.
8	Eskbank	2·00	33·55	49·97	12·91	1·57	1·355	63·18

It is noticeable that the quantity of ash yielded by the Western coals is much greater than is yielded by the Northern ones; also, that the specific gravity is in certain cases much higher.

The ash in all cases was white and dense, whereas many of the Northern coals yield ashes of a buff or red tint, and often quite loose and flocculent.

It is a common opinion amongst the non-scientific that the relative amounts of sulphur present in coals can be approximately estimated by the redness of the ash—on the supposition that the whole of the sulphur exists in the coal in the form of iron pyrites—but such is not the case. On referring to the analysis of the Northern District coals it will be seen that some of the coals which left pure white coloured ashes contained the largest amount of sulphur, and that others which left red ashes contained the smallest quantity of sulphur.

Sulphur may be present in coals in various forms—either in combination with iron as pyrites, which is the most common form of all, as sulphuric acid in combination with the inorganic constituents of the coal, such as alumina, lime, magnesia, or potash; or again, it may exist in the form of organic compounds.

TABULAR VIEW OF THE PERCENTAGE COMPOSITION.

Southern District.

III

No.	Name of Colliery.	Moisture.	Volatile Hydrocarbons.	Fixed Carbon.	Ash.	Sulphur.	Sp. gr.	Coke.
13	Mount Keira	1·15	23·51	64·65	9·70	·99	1·379	75·35
14	Berrima	1·70	32·78	53·84	10·40	1·28	1·364	64·24
12	Mount Kembla	1·50	19·74	67·18	10·72	·86	1·363	Non-coking.
15	Dymock's, Jamberoo	1·50	20·22	56·56	20·70	1·02	1·456	Non-coking.

The specific gravities of these coals do not in all cases bear that same close relation to the amount of ash which was seen in the case of the coals from the Northern Districts.

In order that an opinion may be formed with regard to the coals of New South Wales, it will perhaps not be amiss to compare them with some of those produced in various parts of Great Britain.

In the first place, the proportion of ash in a coal is a matter of the greatest importance; the value of coal as a fuel depends to a great extent upon the smallness of the quantity of non-combustible matter which it contains; if the amount be very large the coal will be perfectly worthless. Neither must the quality or chemical composition of the ash be neglected, for if the ashes be easily fusible, as they usually are when a large quantity of iron is present, they tend to "clinker-up" the grate, and thus cause great waste of heat and the expenditure of much extra time and labour in stoking.

SHALE.

The quantity of shale raised in 1877 was in excess of that of any previous year; but the output of 1878 exceeds that of 1877 in quantity by 5,408 tons, and in value by £10,687, and is equal in quantity to the aggregate output of the first four years, namely, 1865 to 1868 inclusive.

There are at the present time, 3 shale mines in operation.

Since 1865 we have raised 161,670 tons, valued at £428,643.

TABLE showing the quantity and value of Kerosene Shale produced during the years 1865 to 1878.

Year.	Quantity.	Average price per ton.			Total value.
	Tons.	£	s.	d.	£
1865	570	4	2	5·47	2,350
1866	2,770	2	18	10·48	8,154
1867	4,079	3	14	9·21	15,249
1868	16,952	2	17	7·11	48,816
1869	7,500	2	10	0·00	18,750
1870	8,580	3	4	3·18	27,570
1871	14,700	2	6	3·91	34,050
1872	11,040	2	11	11·91	28,700
1873	17,850	2	16	6·55	50,475
1874	12,100	2	5	1·48	27,300
1875	6,197	2	10	2·22	15,500
1876	15,998	3	0	0·00	47,994
1877	18,963	2	9	0·81	46,524
1878	24,371	2	6	11·40	57,211
	161,670	2	13	0·32	428,643

There were, during 1878, 202 persons employed in and about the shale mines, consequently 120·6 tons of shale, valued at £283 4s 5d. was raised for each person so employed.

TIN.

The low price of tin and the scarcity of water during a great part of the year have had a very depressing effect upon this branch of mining industry. In many places ground that would pay under ordinary circumstances has been abandoned, and in others the work has been suspended until the tin market improves. It is gratifying however to find that in some localities, at Vegetable Creek for example, the deposits are sufficiently rich to enable the owners to work them with profit, in spite of these serious drawbacks.

I am assured by a gentleman of very large experience in Cornwall, that notwithstanding the large quantities of tin ore being raised in this Colony and Tasmania, the price of tin will not remain long so low as it now is; and if his expectations as to price, based upon statistics extending over a great number of years, be realized, we may see our tin-fields ere long presenting a much busier aspect than has yet been witnessed. In view of the extent of our known tin-bearing country (about 8,500 square miles) and the richness of our deposits, a moderate rise in the price of tin, and an increased demand, would open up an almost inexhaustible field for the profitable employment of thousands of miners.

Hitherto the great obstacles in the way of the tin-miners have been the expense and difficulty of getting their ore to the smelting works, owing to the distance of the tin-fields from Sydney, Newcastle, &c. These obstacles have, it appears, from Mr. Gower's report, been removed as regards the miners at Vegetable Creek, by the erection of smelting works at Tent Hill, and no doubt the example will be followed on other fields. Mr. Gower states that the fire-bricks used at these works are made from decomposed granite, similar to the China-stone of Cornwall.

It is stated that much of the ground on the Maryland Field is supposed to be exhausted; but this is of small consequence when it is taken into consideration that our tin-bearing country comprises some 5,440,000 acres, and that only a very small proportion of that area has yet been opened, and that our lodes, some of which are very rich, have scarcely been tested yet.

From the following table it will be seen that during the past seven years we have exported 12,107 tons of ore, and 29,881 tons of fine tin, the aggregate value of which is £2,771,888.

TABLE showing the quantity and value of Tin exported from, and the produce of, the Colony of New South Wales, since the opening of the Tin Fields in 1872.

Year.	Ingots.				Ore.				Total.			
	Quantity.	Value.			Quantity.	Value.			Quantity.	Value.		
	Tons.	£	s.	d.	Tons.	£	s.	d.	Tons.	£	s.	d.
1872	47	6,482	0	0	849	41,337	0	0	896	47,819	0	0
1873	911	107,795	0	0	3,660	226,641	0	0	4,571	334,436	0	0
1874	4,101	366,189	0	0	2,118	118,133	0	0	6,219	484,322	0	0
1875	6,058	475,168	0	0	2,022	86,143	0	0	8,080	561,311	0	0
1876	5,449	379,318	0	0	1,509	60,320	0	0	6,958	439,638	0	0
1877	7,230	477,952	0	0	824	30,588	0	0	8,054	508,540	0	0
1878	6,085	362,072	0	0	1,125	33,750	0	0	7,210	395,822	0	0
Total......	29,881	2,174,976	0	0	12,107	596,912	0	0	41,988	2,771,888	0	0

The following table shows the quantity of tin ore raised from some of the principal mines in the several districts during the years 1877 and 1878 respectively. From the number of miners employed at these mines it appears that 2·647 tons of ore, valued at £83 13s. 10d., has been raised for each miner employed.

TABLE showing the quantity of Tin Ore raised at some of the principal mines during the years 1877 and 1878, as shown by the Mining Registrars' Returns.

1877.				1878.			
Locality.	No. of Miners.	Ore.	Value.	Locality.	No. of Miners.	Ore.	Value.
		Tons.	£			Tons.	£
Tingha	800	1,800	57,600	Tenterfield	522	1,107	37,638
Glen Innes.....	30	100	3,000	Vegetable Creek ...	694	1,936	60,984
Vegetable Creek	600	1,749	61,215	Tingha..................	500	1,500	45,000
Tenterfield..............	387	1,400	49,000				
Wilson's Downfall ...	630	1,395	48,825				
Total	2,447	6,444	219,640	Total	1,716	4,543	143,622

The reports furnished by the officers on the tin-fields generally are worthy of careful perusal; but that furnished by Mr. Gower upon the Vegetable Creek Division is especially interesting; and the sketch map of that field attached to his report adds much to its value.

COPPER.

The low price of copper has had the effect of retarding operations at some of our mines, and has prevented the opening up of lodes which are known to contain rich ore, but which cannot be developed without the expenditure of capital, not readily obtained under present circumstances.

Nevertheless, our output of copper for 1878, though much less than it would have been with a better market, exceeds in value the output of 1877 by £20,932, is the largest output we have had since our copper lodes were first opened, equals the aggregate yield of the first fourteen years, and exceeds in value the average annual output for the previous twenty years by £250,562.

The following table of copper and copper ore exported from the Colony indicates the progress made in the development of our cupriferous lodes, but affords no idea of the extent and value of them, because up to the present time comparatively few have been opened, and still fewer have been worked extensively.

TABLE showing the quantity and value of Copper, the produce of the Colony, exported from the Colony of New South Wales, from 1858 to 1878.

Year.	Ingots.		Ore and Regulus.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£
1858	....	....	58	1,400	58	1,400
1859	30	578	....	....	30	578
1860	....	....	43	1,535	43	1,535
1861	....	....	144	3,390	144	3,390
1862	....	....	213	5,742	213	5,742
1863	23	1,680	114	420	137	2,100
1864	54	5,230	....	....	54	5,230
1865	247	15,820	22	545	269	16,365
1866	255	18,905	23	1,885	278	20,790
1867	393	30,189	2 cwt.	5	393	30,194
1868	644	23,297	172	4,000	816	27,297
1869	1,980	74,605	104	2,070	2,084	76,675
1870	994	65,671	6	60	1,000	65,731
1871	1,350	87,579	94	1,297	1,444	88,876
1872	1,035	92,736	417	13,152	1,452	105,888
1873	2,795	237,412	51	1,690	2,846	239,102
1874	3,638	311,519	522	13,621	4,160	325,140
1875	3,520	297,334	157	4,356	3,677	301,690
1876	3,106	243,142	169	6,836	3,275	249,978
1877	4,153	307,181	360	17,045	4,513	324,226
1878	4,983	337,409	236	7,749	5,219	345,158
Total.	29,200	2,150,287	2,905	86,798	32,105	2,237,085

One of the latest copper mines opened is that known as the Thompson's Creek Company's, at Burraga, near Rockley, where the lodes are said to be from 2ft. to 8ft. in width, and the ores contain from 20 to 26 per cent. of copper.

Another comparatively new mine is the Prince of Wales, at Bingera; but the owners of the mine have no smelting works at present, and consequently have to send their ore to Newcastle, a distance of about 285 miles, and have not only great difficulty in procuring teams to carry the ore to the nearest railway station, but have to bear the very heavy expense of carriage, which, at the present price of copper, must be a serious tax upon the output of the mine.

According to the report of the Mining Registrar at Bathurst, the Cow Flat Company's output is from 80 to 100 tons of ore per month. The ore averages 8 per cent. of copper, and the lode, which is from 6ft. to 10ft. wide, has been worked to a depth of 30 fathoms. The output of the North Wiseman's Company is from 30 to 40 tons per month of 8 per cent. ore, and the lode has been opened to a depth of 27 fathoms.

The Milburn Creek Company's mine, near Carcoar, comprising 40 acres of land, is a very valuable one, containing well-defined lodes of rich copper ore.

The mine is situated in lightly timbered box ranges, composed of altered (Upper Silurian) slates and sandstones, dipping W. 10° S. at an angle of 70°. About three-quarters of a mile from the mine, in an E.N.E. direction, these slates give place to ternary granite, while in a W.S.W. direction the nearest granite is distant about a mile and a half. It will thus be seen that the copper lodes occur in a belt of altered slate country bounded by granite.

The surface indications of the several lodes are characteristic. They appear as quartz veins containing much gossan, the result of the decomposition of copper and iron pyrites, and a few stains of carbonate of copper.

At a slight depth the gossan gives place to carbonate and oxide of copper, while below these appear the un-oxide ores, sulphides, etc.

The greater part of the work done in the Milburn Creek Mine has been the extraction of the oxidized ores of copper (carbonates and oxides) which necessarily occur nearest the surface; two distinct lodes have been worked, and on these there have been sunk no less than eighteen shafts, on what is known as the "North and South Lode"; an adit has been driven from the side of the hill, and reaches a depth of 55 feet below the crown of the range.

From this adit nearly up to the surface the carbonates have been removed by stoping.

From one of the shafts, at a depth of 25 feet below the adit, another level has been driven northwards. Good ore (copper glance, yielding in the Company's furnaces 18—20% copper) has been worked in this level, the lode here being from 4 feet 6 in. to 5 feet wide. A specimen of this ore was assayed by Mr. Dixon, F.C.S., and yielded 27·9% copper.

From this level a winze has been sunk to a depth of 27 feet, and from the bottom a drive has been worked northwards. Very good ore has been obtained here, viz., grey sulphide of copper, which in the Company's smelting works yielded 20% of copper, while Mr. Dixon found in a sample submitted to him 45·9%. The lode in places is as much as 11 feet wide, though somewhat irregular, narrowing occasionally to 5 feet 6 inches.

The south shaft is vertical for a depth of 65 feet from the surface, and at this depth a drive has been put in east and west along the lode. A winze has been sunk 29 feet through yellow sulphide of copper and peacock ore, forming a fine lode, which increases rapidly in width as it descends.

The south shaft has been continued down on the underlie to a further depth of 140 feet through the same ore, which at the bottom shows a splendid solid lode, 11 feet 6 inches in width, and without any gangal visible.

The lode at this point dips at an angle of 63°. A sample of this ore was assayed by Mr. Dixon and yielded 16·7% copper, though in the Company's smelting works it only averaged 9%.

The water of the mine holds a quantity of sulphate of copper in solution which, while the shaft is being baled, colours the creek a strong emerald green for a distance of more than a mile from the mine. This sulphate is formed by direct oxidation of the sulphide in the copper pyrites.

In the south shaft the lode is found to improve in solidity and width as it descends, and at a depth of over 200 feet is fully 11 feet 6 inches from wall to wall.

I am indebted to George Hardie, Esq., the Manager, for the following information respecting the Great Cobar Copper Mine :—

This mine is situated at Cobar, 110 miles south of Bourke, and about 300 north-west of Orange. The Company's land comprises 680 acres of freehold and conditionally purchased land. Three distinct lodes run through the property, known as the "East Lode," "Middle Lode," and "West Lode." Operations thus far have been confined to the "Western Lode,"upon which four shafts have been sunk—"Becker's," to 324 feet, "Barton's," to 324 feet, "Hardie's," to 214 feet, "Renwick's," to 286 feet.

Becker's Shaft. Good ores exist from the surface to the bottom. At the 26-fathom level the lode in the shaft is 24 feet wide, composed of carbonates and gray ores. At this level drives have been put in north 130 feet and south 270 feet, proving the lode to be on an average 18 feet wide, and worth 14%.

At the 39-fathom level drives have been put in north 90 feet and south 110 feet, the lode averaging 12 feet throughout of good ores.

At the 54-fathom level the lode is proved to be at least 17 feet wide, of solid sulphurets, worth 22%.

Barton's Shaft is 600 feet south of "Becker's." At the 15-fathom level drives have been put in 191 feet, the lode averaging 15 feet of good carbonates. At the 26-fathom level drives have been put in north 180 feet and south 161 feet; the lode throughout these drives will average *40 feet wide*, of gray carbonate and oxide ores of good quality. At the 39-fathom level drives are in north 136 feet, and south 80 feet, the lode throughout being fully 15 feet wide, worth 14%.

At the 54-fathom level the same sulphurets precisely have been cut as in Becker's shaft at same level.

Hardie's Shaft, 180 feet south of "Barton's," is down 214 feet, with good ore to be found in every winze and drive.

Renwick's Shaft, 260 feet south of "Hardie's," is connected with "Hardie's" at the 15 and 26 fathom levels, proving the existence of first-class ores. No work has been done south of "Renwick's" shaft.

Barton's Shaft is the main shaft, and is fitted with skids and cages to the 54-fathom level. A 40 h.-p. engine does all the hauling, works the ore-breakers, also rollers for crushing fire-clay, and saw-mill, &c., and in due time will work one of Hancock's patent jiggers, specially designed for treating poor ores.

Furnaces. There are eight furnaces in full work—*six* reducing, *one* roasting, and *one* refining. The present output is about 40 tons of fine copper per week. Additional furnaces are being erected with all speed.

Tanks. The Company have expended several thousand pounds in conserving water, and have just completed a 10,000-yard tank in addition to their previous supply. The whole of the copper, under agreement with Messrs. Wright, Heaton, and Company, is brought to Sydney, instead of to Adelaide, as formerly. The population of Cobar cannot be less than 1,000 persons, and although dependent mainly upon the mine for their support, it is not difficult from the extraordinary deposits of copper ore already discovered to predict a permanent and prosperous future.

The output of this mine for the past year is 1,468 tons of fine copper, valued at £88,080. This mine has been in work 3½ years, during which period 18,993 tons of ore have been smelted, yielding 2,683 tons of refined copper, which assays 99·50 to 99·60, valued at £160,980.

Copper ores from the Cobar Mine, the samples being taken from the different lodes worked.

No. 56.—*Copper Pyrites and Magnetite.*

Silica	4·26
Copper	22·84
Antimony	·61
Bismuth	2·11
Lead	·27
Arsenic	traces
Iron	39·20
Zinc	·35
Silver	traces
Sulphur	24·11
Oxygen, water, loss and undetermined	6·25
	100·00

Calculated into proximate constituents, these results give—

Silica	4·26	
Cuprous sulphide	28·60	Copper pyrites 66·04
Ferric sulphide	37·44	
Antimony „	·85	
Bismuth „	2·59	
Lead „	·31	
Zinc „	·52	
Furoso ferric oxide	24·50	
Traces arsenic, silver, water, and loss	·93	
	100·00	

The copper pyrites was bright and distinct, interspersed with the magnetite, which remained on treating the mineral with nitric acid.

No. 57.—*Mixture of Red Oxide of Copper, Copper Glance, and Ferric Oxide.*

Silica	2·06
Copper	54·06
Antimony	traces
Bismuth	1·47
Lead	·41
Iron	7·28
Nickel	traces
Magnesium	5·33
Silver	traces
Sulphur	4·18
Carbonic acid	9·97
Water	3·41
Oxygen, loss and undetermined	11·83
	100·00

Calculated into its proximate constituents from these results, this ore gives :—

Silica	2·06
Cuprous sulphide	20·77
Cuprous oxide	42·03
Lead ,,	·44
Bismuth ,,	1·64
Ferric ,,	10·40
Magnesium carbonate	19·03
Water	3·41
Loss and traces of substances undetermined	·22
	100·00

Ferric oxide was left undissolved on treating with nitric acid.

No. 58.—*Mixture of Copper Pyrites, Red Oxide of Copper, and Ferric Oxide.*

Silica	·62
Copper	37·87
Antimony	traces.
Bismuth	1·90
Lead	·45
Iron	30·80
Nickel	traces.
Sulphur	18·63
Oxygen, water, and loss	10·00
	100·00

Calculated into the proximate constituents, these results give :—

Silica	·62	
Cuprous sulphide	22·81	Copper pyrites, 52·63.
Ferric ,,	29·82	
Cuprous oxide	22·13	
Ferric ,,	21·20	
Bismuth ,,	2·12	
Lead ,,	·50	
Water, traces antimony, nickel, lime, magnesia, and loss	·80	
	100·00	

The ferric oxide was not dissolved by nitric acid.

No. 59.—*Copper Glance with Ferric Oxide.*

Silica	1·92
Copper	54·93
Antimony	traces.
Bismuth	2·58
Iron	18·26
Sulphur	14·48
Oxygen, water, and loss	7·83
	100·00

Calculated into the proximate constituents, these results give :—

Silica	1·92
Cuprous sulphide	26·09
Bismuth ,,	68·73
Ferric oxide	3·16
Water and loss	·10
	100·00

No. 60.—*Copper Pyrites and Magnetite.*

Silica	·96
Copper	26·47
Antimony	·46
Bismuth	2·17
Iron	39·09
Sulphur	27·46
Oxygen, water, and loss	3·39
	100·00

Calculated into the proximate constituents, these results give :—

Silica	·96	
Cuprous sulphide	33·14	Copper pyrites, 76·49.
Ferric ,,	43·35	
Antimony ,,	·64	
Bismuth ,,	2·66	
Furoso ferric oxide	18·82	
Water, loss, and undetermined	·43	
	100·00	

No. 61.—*Copper Glance and Red Oxide.*

Silica	20·68
Copper	63·24
Antimony	·13
Bismuth	1·18
Iron	1·74
Sulphur	5·70
Carbonic acid	traces.
Oxygen and loss	7·33
	100·00

These numbers give for the proximate constituents—

Silica	20·68
Cuprous sulphide	28·52
Cuprous oxide	46·62
Antimony ,,	·16
Bismuth ,,	1·32
Ferric ,,	2·48
Traces carbonic acid, water, and loss	·22
	100·00

No. 62.—*Copper Glance, with veins of Malachite running through it.*

Silica	·56
Copper	57·42
Antimony	traces.
Bismuth	·95
Lead	7·79
Magnesium	traces.
Iron	4·99
Sulphur	11·67
Carbonic acid	5·87
Water	4·60
Oxygen and loss	6·15
	100·00

The proximate constituents calculated from these numbers are—

Silica	·56
Cuprous sulphide	50·39
Copper, hydrated carbonate, malachite ($CuO_2CO_2Aq.$)	31·88
Bismuth sulphide	1·45
Lead ,,	8·97
Ferric oxide	7·13
	100·38

No. 63.—*Green Carbonate of Copper with Ferric Oxide.*

Silica	10·64
Copper	42·79
Bismuth	1·24
Iron	8·49
Carbonic acid	14·37
Water	7·04
Oxygen and loss	15·43
	100·00

These numbers give for the proximate constituents—

Silica	10·64
Hydrated carbonate of copper Malachite ($CuO_2CO_2Aq.$)	74·48
Oxide of bismuth	1·38
Ferric oxide	12·14
Water	1·02
Loss and undetermined	·34
	100·00

No. 64.—*Blue Carbonate of Copper Azurite.*

Silica	29·28
Copper	38·23
Bismuth	·21
Iron	·78
Carbonic acid	17·47
Water	3·79
Oxygen and loss	10·24
	100·000

The proximate constituents calculated from these numbers are—

Silica	29·28
Azurite ($3CuO_2CO_2H_2O$)	69·45
Oxide of bismuth	·22
Ferric oxide	1·12
Water	·18
	100·25

No. 65.

The copper made from these ores is somewhat difficult to refine, and does not come to a proper "tough pitch," from the presence of bismuth. The following is an analysis of the refined copper produced.

Copper	99·346
Bismuth	·419
Iron	·083
Lead	·086
Silver	·026=8 oz. per ton.
Antimony	·029
Traces arsenic, nickel, cobalt, gold, and loss	·011
	100·000

When it is considered that our known cupriferous formations cover an area equal to about 4,296,320 acres, and that there are enormous tracts of country yet unexplored in which copper lodes will probably be found, the following table, showing the percentage of copper in samples of ore from various parts of the Colony, will convey some idea of the extent of our resources.

PERCENTAGE COMPOSITION OF COPPER ORES—TABULAR VIEW.

Oxidized Ores.

No.	Locality.	Description.	Percentage of Copper.	Silver.			Gold.		
				oz.	dwts.	grs.	oz.	dwts.	grs.
26	New Wellington	Red oxide	14·26	....			....		
38	Bingera	„	19·94	1	2	5	traces		
41	Clarence River	„	22·67	....			....		
35	Apsley, Bathurst	„	22·82	....			....		
33	Mitchell's Creek	„	25·79	1	11	7	14	10	6
36	Peelwood, Tuena	„	49·27	4	4	22	traces		
32	Mitchell's Creek	Green carbonate	9·48	9	9	19	4	10	18
31	„	„	12·57	13	13	6	1	2	20
28	Three-mile Flat, Wellington.	„	13·15	8	3	8	traces		
20	Wiseman's Creek	„	16·72	7	19	17	traces		
23	South Wiseman's Creek	„	27·06	21	19	16	traces		
	Pyritous Copper Ore.								
42	Clarence River	Pyrites	3·07	2	15	12	traces		
27	Kadumble Range, Wellington.	Mixed sulphides	8·98	3	18	9	traces		
21	Wiseman's Creek	Pyrites	9·30						
22	„	„	11·30						
24	South Wiseman's Creek	„	12·78	6	17	4	traces		
25	Wellbank, Wellington	Mixed sulphides	13·39						
34	Apsley, Bathurst	Pyrites	18·72	10	6	10	traces		
37	Peelwood, Tuena	„	21·38	12	11	14	traces		
29	Cargo	Mixed ore	23·16	25	12	20	traces		
39	Bingera, New England	Pyrites	23·71						
40	Clarence River	„	24·19						
30	Ophir Copper Company	„	27·49	6	0	20	traces		

Mr. S. L. Bensusan, who, by reason of his ability and large experience may be regarded as an authority, has expressed, in a letter recently published in the *Town and Country Journal*, respecting the production of copper and the price thereof, an opinion that the production of copper in Chili will decrease to a considerable extent, and that there will be a very large decrease in the supply from cupreous pyrites; and as more than one-half of the entire production of the world has been obtained from these sources, he infers that the decrease referred to will lead to a corresponding increase in the price of copper, which will, he estimates, not be less than from £70 to £75 per ton. If Mr. Bensusan's views prove correct, we may hope to see many of our copper mines, which are at present idle, in full work, and numerous lodes opened up that have hitherto been barely tested.

IRON.

The deposits of iron ore in this Colony, though extensive and valuable, have not hitherto received the attention they deserve, considering that in most cases not only is the ore found in almost unlimited quantities, but coal and limestone are in close proximity.

At Nattai the Fitzroy Company has expended a large sum of money in the erection of smelting works &c., but owing to the Company having failed to obtain suitable coal in the immediate vicinity of the works (though it is believed suitable coal could be found there if sought for), and possibly the want of experience in the treatment of the particular description of iron ore in that locality, the works have been idle for some time past.

At Wallerawang or Lithgow within a radius of four miles are to be found iron, coal, and limestone. (*Vide* Mr. Wilkinson's Geological Map of that district.) The ores consist of magnetite averaging 40·89 per cent. of metallic iron, garnet ironstone containing 20 per cent. iron, brown hematite, 38·84 to 51·52 per cent. iron, clay bands, 49·28 to 56 per cent. iron.

Near the surface the vein of magnetite varies in width from 13 feet to 24 feet; at a depth of 43 feet the vein of brown hematite is from 18 feet to 20 feet wide, and of the clay bands there are five, averaging in thickness from 6 to 18 inches, interstratified with the coal measures immediately above the principal or lowest coal seam.

The Eskbank Company has recently erected very extensive iron works at Lithgow for the manufacture of pig and rolled iron. During 1878 the Company made 389 tons of pig-iron, valued at £1,556, and 511 tons of finished bar-iron, valued at £5,100, but the operations will be much more extensive during the present year. The Company is at present engaged in the manufacture of rails for the Sydney Tramway, and will shortly be in a position to make large quantities of sheet-iron and iron-wire.

The following analyses were made by Professor Liversidge of samples of ore collected by him in 1874:—

Silica and insoluble matter	18·70 per cent.
Metallic iron	40·89 ,,
Phosphorus	Traces.
Sulphur	Traces.

Analysis of loose brown Hematite.

Water, hygroscopic	2·74
,, combined	9·70
Silica and insoluble matter	25·33
*Sesquioxide of iron	54·23
Phosphorus	·27
Sulphur	·12
†Undetermined	7·61
	100·00

---

* Equivalent to 37·84 per cent. metallic iron.

† Consisting principally of manganese, alumina, lime, and magnesia.

Analysis of Goethite and massive Hematite.

Water, hygroscopic	1·28
,, combined	12·04
Silica and insoluble matter	12·19
*Sesquioxide of iron	73·60
Phosphorus	·12
Sulphur	·06
†Undetermined	·71
	100·00

Analysis of clay band iron ores.—Clay band No. 1.

Water, hygroscopic	1·28
,, combined	3·54
Silica and insoluble matter	4·60
‡Sesquioxide of iron	80·00
Phosphorus	·49
Sulphur	·11
†Undetermined	9·98
	100·00

Rich iron ore is also found at Mount Lambie, at Berrima, at Illawarra, at Coombing Park near Carcoar, and at numerous other places in the Colony, but in none of these localities has the ore been worked.

SILVER AND LEAD.

The recent discoveries of silver ore at Boorook, in the Tenterfield District, are likely to attract attention to the rich lodes in that and various other parts of the Colony, and to lead to the development of this important but hitherto almost unexplored source of wealth.

From time to time lodes have been discovered and attempts have been made to treat the ore, but so far without success, not because of the poorness of the ore, but because the necessary skill and appliances for its proper treatment were not available.

The lodes at Boorook are so rich and extensive that the miners there are tempted to persevere, in spite of difficulties which have elsewhere been regarded as insurmountable. When the discovery was first made samples of the ore were forwarded to this Department for assay, and, as will be seen by the following list, the results were eminently encouraging:—

Silver Ores and Minerals where the chief valuable constituent is Silver.

No. 33. Quartz from Addison Reef, Boorook, near Tenterfield. Dark gray, coloured with disseminated pyrites, amounting to 10·15 % Silver present, as sulphide and sulph. antimonide as well as free, contained—

Gold... 18 ozs. 6 dwts. 10 grs per ton. Silver.......... 522 oz. 2 dwts. 0 grs. per ton.

No. 34. Mispickel, from Bolivia, near Tenterfield—

Gold .... 4 dwts. 15 grs. per ton. Silver......... 2 ozs. 13 dwts. 0 grs. per ton.

No. 35. Quartz, with galena, from Copenhagen Reef, Boorook, contained—

Gold .... 10 grs. per ton. Silver .... 5 ozs. 16 dwts. 4 grs. per ton
Lead .... 13·40 per cent.

No. 36. Quartz, from Addison Reef, Boorook—

Gold .... 5 grs. per ton. Silver .... 1 oz. 4 dwts. 9 grs. per ton.

---

* Equivalent to 51·2 per cent. metallic iron. † Consisting principally of manganese, alumina, lime, and magnesia.
‡ Equivalent to 56 per cent. metallic iron.

No. 37. Quartz, much stained with oxide of iron, from Addison Reef, Boorook, contained—

Gold .... 18 dwts. 10 grs. per ton Silver......... 20 ozs. 8 dwts. 0 grs. per ton.

No. 38. Quartz, soft and friable, reddish-coloured, with same pyrites, from Golden Age Reef, Boorook, contained—

Gold .... 9 dwts. 14 grs. per ton Silver .... 80 ozs. 1 dwt. 5 grs. per ton.

No. 39. Porous quartz, much stained with oxide of iron, from Silver Age Reef, Boorook, contained—

Gold................................ 5 grs. per ton. Silver .... 1 oz. 4 dwts. 19 grs. per ton.

No. 40. Piece of amalgam from 4 lbs. stone, from Copenhagen Reef, yielded a button weighing 1 oz. 12 dwts., and containing—

Gold..................................... 0·188 grs. Silver .... 2·271 grs.

No. 41. Pyrites from Golden Age Reef, Boorook, before amalgamation in Berdan machine, contained—

Gold............ 3 ozs. 15 dwts. 5 grs. per ton. Silver .... 248 ozs. 13 dwts. 14 grs. per ton.

No. 42. Pyrites after amalgamation in the Berdan machine yielded—

Gold............ 8 ozs. 0 dwts. 0 grs. per ton. Silver......... 446 ozs. 6 dwts. 19 grs. per ton.

It is evident that the lighter material had been washed away during the grinding, and the material left was thus enriched, or that a portion of the denser particles had been sent, as No. 42 evidently contained less quartz than No. 41.

No. 43. Quartz from New Reef, Boorook, contained—

Gold..................... 1 dwt. 5 grs. per ton. Silver............ 6 ozs. 7 dwts. 14 grs. per ton.

No. 44. Quartz containing galena, mispickel, and iron pyrites, from Tenterfield, containing—

Silver........ 13 ozs. 3 dwts. 10 grs. per ton. Gold............5 grs. per ton.

No. 50. Surface stone from the Golden Crown Reef, about 10 chains west of Addison Reef, Boorook. (Red and black quartz) with drusy cavities, containing antimonide of silver; quartz contains sulphide of silver and small threads of native silver, contained—

Silver...... 522 ozs. 2 dwts. 0 grs. per ton. Gold............ 18 ozs. 6 dwts. 10 grs. per ton.

No. 51. Surface stone from the Alderman Reef, about 3½ miles N.N.W. of Boorook Station, consisted of two different stones, one similar to No. 50, the other bluish-gray quartz with yellow veins, contained—

Silver... 37 ozs. 15 dwts. 14 grs. per ton. Gold............ 9 dwts. 5 grs. per ton.

No. 52. Surface stone from Woolshed Reef, near the Alderman Reef, red quartz, much stained, with oxide of iron, yielded—

Silver...... 5 ozs. 10 dwts. 0 grs. per ton. Gold............ 19 grs. per ton.

No. 53. Stone from 50-feet level of Golden Age Reef, Boorook, bluish quartz, showing iron pyrites, numerous small thread-like veins of sulphides of silver and lead, and small drusy cavities with antimonide of silver, yielded—

Silver...... 98 ozs. 16 dwts. 19 grs. per ton. Gold.........1 oz. 4 dwts. 0 grs. per ton.

No. 54. Stone from 30-feet level of Addison Reef, Boorook, rather dense bluish quartz, with finely disseminated pyrites, contained—

Silver...... 42 ozs. 10 dwts. 0 grs. per ton Gold......... 10 dwts. 19 grs. per ton.

The treatment adopted in the first instance was similar to that of auriferous quartz, the discoverers having a small battery for reducing the stone, and a Berdan machine for amalgamating, but it was soon discovered that a very large proportion of the silver was carried away in the tailings, &c., &c., as will be seen from the following extract from a report furnished by Mr. Warden Graham.

EXTRACT from MR. WARDEN GRAHAM'S REPORT, dated 11th October, 1878.

"While at Boorook I again visited the machine now working there, and the various reefs previously reported on by me—particularly the Addison and Golden Age.—I found very little alteration in the working, or the means used for saving the silver. The battery, as I have previously mentioned, is a three-stamper one driven by a six-horse-power engine. In connection with this battery a Berdan machine is worked. The stuff, after crushing, is run over blankets, and what is saved in that way is passed through the Berdan machine for amalgamation with quicksilver. Only about one-fifteenth ($\frac{1}{15}$) of the stone crushed is treated in this way—the remainder (that which passes over the blankets) is run into sludge-pits and saved for further treatment.

The means of saving are, in my opinion, and also in the opinion of the proprietors of the machine, quite inadequate for the purpose of extracting silver ore, and I am convinced that not one-fourth of the silver out of the stone crushed is obtained.

The assay made of the tailings or refuse from this Berdan machine and forwarded with my report of the 10th July last went 8 ozs. gold and 446 ozs. silver to the ton, clearly proving that the process of amalgamation by the Berdan machine now adopted saves only a small proportion of the silver. The loss in this way and the treatment only of one-fifteenth of the stone crushed warrants me in coming to the conclusion that not one-fourth at the very most is saved.

The saving on blankets is a good process for gold or other very heavy mineral, but not for silver ores, such as chlorides and sulphurets, the specific gravity of which is scarcely greater than the sludge. In order to have this properly tested, I forward samples fairly taken as follows—1st, from the machine just as it comes out of the stamper boxes; 2nd, from the blankets (that is, the stuff which is treated in the Berdan machine, and from which only, at present, the silver is obtained); 3rd, tailings from Berdan machine after treatment; 4th, tailings from the blankets, now saved in sludge-holes for further treatment. The samples I respectfully recommend be assayed.

These samples were assayed with the following results:—

No. 46. Crushed stone from the stamper boxes—the stone was taken from the 50-ft. level, Golden Age Reef, Boorook, yielded—

Silver...... 83 ozs. 12 dwts. 19 grs. per ton. Gold... 1 oz. 0 dwts. 0 grs. per ton.

No. 47. Blanketings from No. 46 gave—

Silver... 71 ozs. 14 dwts. 19 grs. per ton. Gold... 0 oz. 17 dwt. 5 grs. per ton.

No. 48. Tailings from the Berdan pans, Boorook—

Silver...... 38 oz. 1 dwt. 14 grs. per ton. Gold... 0 oz. 9 dwt. 5 grs. per ton.

No. 49. Tailings from the blankets, Boorook—

Silver......... 10 ozs. 1 dwt. 5 grs. per ton. Gold... 2 dwts. 9 grs. per ton.

Sample No. 30, from Golden Crown Prospectors Shaft, Boorook, consisting of quartz with bright red oxide of iron, sulphides, and chloride of silver, contained—

Silver... 284 ozs. 13 dwts. 14 grs. per ton. Gold... 4 ozs. 5 dwts. 14 grs. per ton.

No. 31, from Grand Junction Prospectors Shaft, Boorook, consisting of quartz with oxide of iron and iron pyrites, contains—

Silver... 5 ozs. 10 dwts. 0 grs. per ton. Gold... 1 dwt. 15 grs. per ton.

No. 32, from Grand Junction, Yates's lease, is similar in appearance to No. 31, but contains silver as chloride, and yields—

Silver... 124 ozs. 12 dwt. 19 grs. per ton. Gold... 1 dwt. 15 grs. per ton.

No. 33, from Honeyman's Reef, consisted of two different specimens—first, dark-coloured quartz; second, of a reddish decomposed quartz, and yielded—

Silver... 1 oz. 16 dwt. 10 grs. per ton. Gold... 0 oz. 0 dwt. 19 grs. per ton.

No. 34, from Addison Reef, consisting of white quartz with oxide of iron and traces of sulphide of iron (iron pyrites), contained—

Silver... 0 oz. 16 dwts. 0 grs. per ton. Gold... 0 oz. 0 dwt. 10 grs. per ton.

Mr. W. A. Dixon, F.C.S., F.I.C., who had made the assays, but had not examined the lodes, was then applied to for advice as to the best mode of treatment, and he made the following recommendation:—

I was requested to report on the best method of treating silver ore No. 24, which contained a very considerable quantity of pyrites in a form which could easily be separated from the quartz by dressing after careful crushing, and in my report I said—

"Before entering on the question of the treatment of this ore I considered it necessary to determine the pyrites and ascertain the form in which the silver is combined. I find the total pyrites to be 10·16 per cent., and that the silver is partly, at least, present as antimonide. The best method in this case is certainly to crush the ore and dress it, saving the slimes, the crushing being so managed as to make as little slimes as possible. The ore could thus easily be reduced to one-fifth, and this enriched residue should be smelted with roasted galena or litharge, or scorified with the addition of some cheap flux, as lime or sulphate of soda, or both, the lead being afterwards cupelled. The ore could also be treated directly or after concentration by careful roasting with salt, and afterwards amalgamated in bands with scrap iron and mercury. This method would, however, involve the loss of much silver and gold, probably 20 per cent. of the total metals, even if the greatest care were taken.

"From Mr. Warden J. B. Graham's report of 11th October, it seems that the treatment of such of the ores as have been already worked is exceedingly crude, much of the silver being lost by the imperfection of the process. It seems probable indeed that most of the silver which has hitherto been obtained is that which is present in the ore in the free state, and that on further sinking on the reef, when the water level is reached and black unweathered ores only are obtained, the produce by the present method would be nil.

"At present the stan after crushing is run over blankets, and the material saved on them is subjected to grinding with mercury in a Berdan pan, the tailings being run into pits to be saved for subsequent treatment. The separation of the ore by the blankets, if the slimes had also been saved, would have been pretty successful in the first ores which I saw, but in recent specimens the silver is much more minutely disseminated through the quartz.

"If the contents of the stan going through the battery is compared with the products it will be seen that great loss is experienced. Mr. Graham reports that five or six tons of the stan is passed throngh the machine in twelve hours, and that about half-a-ton of this is saved on the blankets, and yields 100 ounces of silver. Now, five tons of stan going through the battery (No. 46) contains 418 ozs. of silver and 5 ozs. of gold, whilst the half-ton of tailings from the Berdan would contain, by my assay, 19 ozs. 0 dwt. 17 grs. of silver; and even if the whole of the tailings from the blankets had been saved, as these contained 10 oz. 1 dwt. 5 grs. of silver per ton, the loss of silver on the treatment of the five tons would be 252 ozs., supposing that all the silver in the residue collected was subsequently recovered. This great loss is doubtless due to the exceeding friability of the silver ores—the finest slimes, which take many hours to settle in still water, invariably containing more silver than the original ore. Phillips says of the Nevada ores, that they yield 20 per cent. of slimes (not tailings), which from an ore containing 80 ozs. per ton contains 100 ozs. per ton. I have myself found in one instance the slimes to be much more enriched than that when the mineral was carefully hand-crushed and dressed; but the quantity of the slimes produced was not more than 12 per cent. of the ore operated on.

"In America, the water holding the slimes in suspension is run into large settling ponds, 3 or 4 ounces of alum is added for each thousand gallons of liquid, and the whole is left at rest until the water is perfectly clear, the clarification being much hastened by the alum.

"In the United States, the richer silver ores, containing over 80 ozs. per ton, are ground dry, roasted with from 5 to 10 per cent. of salt, and treated by amalgamation in bands with scrap iron.

"The poorer ores, especially in places where fuel is scarce, are treated by a direct method, which would be a vast improvement on that now adopted at Boorook, whilst it has the advantage that the plant already on the ground would be available. This process is based on the same principle as the patio process of Mexico, namely, that chloride of copper in presence of salt converts sulphide of silver into chloride. In Nevada, however, the process is hastened by artificial heat, and the reduction of the chloride of silver instead of being effected by the mercury (which causes enormous loss of this metal in Mexico) is effected at the expense of the iron of the grinding pans.

The process is carried out as follows: The ore is broken and crushed under stampers, the whole of the material being carefully saved, and 1,250 to 1,500 lbs. of the sand is ground to an impalpable powder in a Wheeler pan or other grinding machine, which in the Wheeler pan takes about an hour. The contents of the pan are then heated to about 200° F. by steam, taking care not to dilute the sand to too great an extent by the condensed steam, and 10 per cent. to 15 per cent. of the weight of the ore of mercury is showered into the pan by pressing it through a canvas bag. Two pounds of sulphate of copper and three pounds of salt, or more, are then added, and the grinding continued for three hours and a half, the temperature being kept between 180° and 200° F. Water is then added and the whole transferred to a wooden settling cistern, where it is kept in gentle motion until the mercury has settled. The pulp must only be so diluted that the mercury may fall to the bottom, and if it appears thicker at the bottom of the settler than at the top when the hand is plunged into it (the stirrers making six or seven revolutions per minute) too much water has been added. The separation takes about three hours, and when it is effected the sludge is washed away and the mercury filtered to obtain the amalgam which is retorted. In this way from 65 per cent. to 80 per cent. of the silver is obtained, according to the ore operated on and care taken, the loss of mercury averaging about 15 ozs. per ton of ore.

"It seems highly probable that other discoveries of silver ore may be made in New South Wales. Such discoveries not having been made before is doubtless due to the fact that silver ores are not so readily recognizable as gold, and that prospectors have often little general mineralogical knowledge, in evidence of which we need only consider the comparatively recent discovery of the rich tin deposits lying almost on the surface. Many of the ores which have been worked for gold—notably, about Mitchell's Creek—have left tailings containing much silver, and doubtless in treating the gold a great quantity of this metal has been lost from the cause already stated.

"It may be of some assistance to prospectors to note that silver deposits are generally found amongst the ancient stratified rocks, as micaceous, quartzose and clay slates, limestones, and sandstone, near granite. All the great silver deposits of the world, as the Canstock in Nevada, Nacatecas and others in Mexico, Carpathic in Europe, and in Bolivia, are found accompanying a recent dioritic porphyry (the prophylite of Rehthofen), probably of tertiary or post tertiary age, though resembling ancient rocks. This rock is composed of a fine granite basis, generally greenish, but sometimes red, gray, or brown, with imbedded crystals of olioclam and dark green fibrous marks blended, whilst quartz is generally absent. The rock, containing much iron, is decomposed by weathering, becoming stained red by the oxide.

"The silver is generally found in quartz, and the surface of the reef is usually drusy and much stained with oxide of iron, whilst the quartz is often very friable."

The prospectors persevered in spite of want of capital, and found that by adopting some of Mr. Dixon's suggestions, and with the addition to their plant of a Wheeler's pan, they were able to save some of the silver that had previously passed away. They also found that by treating their tailings a second time they were able to extract as much or more silver from them than they had obtained by the first treatment from the ore. Mr. Warden Graham states that 95 tons of tailings gave 2,000 ozs. of silver, and 2 tons treated with salt after exposure gave 66 ozs., but they were satisfied that a large percentage of the silver was still escaping.

The Department recognizing the importance of encouraging and aiding as far as possible in the development of these valuable lodes, secured the services of Mr. Lamont Young, formerly of the Geological Staff, to visit the locality and inspect the mines and the mode of treatment at Boorook, with a view to suggest some more effective method of saving the silver. The time at Mr. Young's disposal was unfortunately very limited, consequently he was unable to do justice to the district as regards examining and reporting upon the lodes, but he has furnished the following report, which it is hoped will have the effect of introducing such improvements in the treatment as will secure to the miners a much larger proportion of the silver than has hitherto been saved.

L. Young, Esq., to The Under Secretary for Mines.

Sir,

In accordance with your instructions, I beg to submit the following Report on the Boorook Silver Mines, and the best method of treating the ore.

The Boorook Silver Mines are situated in hilly country, some 26 miles to the N.E. of Tenterfield. They can be approached by two routes; one following the main road into Queensland as far as Boonoo Boonoo, where as a bridle path it strikes off through the bush, and the other along a very fair coach road crossing Sandy Creek; there is, however, no bridge over the latter, and in flood time this road is closed; the relative length of these roads is estimated at 27 and 29 miles. A new route has been found from Boorook to Stanthorpe, but this also will be impassable in flood-time, unless one or two bridges are built.

A large quantity of ground has been taken up in leases. The population, now about 200, is rapidly increasing. There is a large store, a post-office, a public-house, and many bark-buildings, and the survey of the village, water, and camping reserves is being proceeded with.

The lodes are situated in belts of *Felspar porphyry*, alternated with beds of altered and fossiliferous shales; the fossils which I collected have been identified by the geological surveyor in charge as *Favosites polymorpha*, *Productus*, *Fenestrella*, and *Spirifer*, and are indicative of the Upper Devonian formation.

There have been a considerable number of lodes discovered, but in nine instances only have any explorations worth mentioning been prosecuted, and these are of slight extent. Thus the Golden Age, the only claim from which stone was being crushed at the time of my inspection, has two shafts down, 75 ft. and 50 ft., the driving N. and S. from the 50-ft. shaft being 22 ft. and 18 ft. respectively. No. 1 north has a shaft down 40 ft., No. 1 south a shaft 30 ft. and begun driving north; No. 2 south, shaft 28 ft. The Addison Reef prospectors' claim shaft 50 ft., No. 1 north shaft 18 ft. The Golden Crown prospectors' claim one shaft 55 ft. The Grand Junction prospectors' claim, two shafts 30 ft. and 18 ft. respectively. The John Moffatt prospectors' claim one shaft 12 ft. These were the principal workings at the time of my visit; since then they have doubtless been extended. There are also old workings executed seven years ago in search of gold on the Happy Valley (Hurley's), the Robinson, the Nil Desperandum, the Copenhagen, and the Mariner's lines of reef.

The general strike of the reefs is a little to the east of north and west of south, with a slight dip to the west. The character of the reef in the Golden Age is as follows :—A reef 8 inches wide, of bluish semi-transparent quartz, much stained with oxide of iron; on the hanging (western) wall is a black pyritous clay band 2 inches thick; there are besides a number of smaller leaders of quartz stained in the same manner as the large vein; the whole are contained in a white clay. The character of the Addison Reef is quite different; it seems an intimate mixture of quartz, chlorite, and iron pyrites. The stone from all the new workings has been found on burning in the forge to show more or less metallic silver; subjoined are the results of some of the assays made for the Department of Mines :—

	Silver per ton.			Gold per ton.		
	oz.	dwt.	gr.	oz.	dwt.	gr.
Addison Reef	522	2	0	18	2	10
,, (30 ft. level)	42	10	0	0	19	19
,, No. 1	1	4	9	0	0	5
,, No. 2	20	8	0	0	8	10
Golden Age Reef	80	1	5	0	9	14
,, (50 ft. level)	98	16	19	1	4	0
Golden Crown Reef (Surface stone)	459	16	10	5	11	14
Woolshed Reef (Surface stone)	5	10	14	0	0	19
Alderman Reef (Surface Stone)	370	15	14	0	9	5

There are besides the reefs on which the workings were mentioned four or five others, the outcrops of which have been opened on, and some of these, notably the North Pole Reef and the Clifton Reef, have a favourable appearance.

From the above it will be seen that silver-bearing stone has been discovered over a considerable tract of ground, but that though the reefs have been found to be highly argentiferous in places they have only been prospected near the surface.

The silver-bearing minerals appear to be much disseminated through the matrix of the reefs. Argentite (sulphuret of silver) seems to be the chief source of the silver; there are also present chloride of silver and red silver ore. The associated minerals are iron pyrites in considerable quantity, free gold, copper pyrites, oxide of iron, galena, quartz, and chlorite; the latter mineral in some cases, as in the Golden Crown, forms the walls of the reef.

There is plenty of excellent timber, and many of the reefs are most advantageously situated for being worked by tunnels (adits.)

The present mode of treatment adopted by Messrs. Horton and Co. is as follows :—The stone from the reef is crushed in bulk; it is then carried from the gratings of the stamper-box by water into settling pits; thence it is charged in Wheeler pans, where a certain proportion of the silver (Mr. Horton told me one-fourth) is extracted in the form of amalgam, the latter being retorted.

As it is my intention to recommend the use of these pans to a certain extent, it may be well to point out here the points on which particular attention should be paid:—

1stly. When the crushed ore (sludge) from the settling pits, or elsewhere, is being introduced into the pans, *its condition, especially at first, should not be too stiff.* Experience will soon teach the proper consistency.

2ndly. The sludge should be *gradually and completely* reduced, by grinding, to the finest mud.

3rdly. The next step, and one to which I do not think enough attention has been paid at Boorook, is to *raise the temperature of the sludge*, by blowing steam into it, until a temperature of about 200° F. has been reached, care being taken that the condensed steam does not render the mud too liquid.

4thly. The muller should be slightly raised, and the quicksilver added in *a finely divided state*, by squeezing it through canvas.

5thly. As soon as all the quicksilver has been introduced, add about 3 lbs. of sulphate of copper in the form of a concentrated solution, and continue the running of the pan for three or four hours, care being taken to *maintain the contents of the pan in a hot condition.*

6thly. *The rate at which the muller is driven* during the above operation should be made the subject of experiment.

7thly. The sludge when run into the separator should be very *carefully and thoroughly* washed; if this is not done some of the finely divided amalgam will be washed away.

8thly. The collected amalgam is then squeezed and retorted in the usual manner, while the unattacked mineral and sludge should be washed on slime tables, and the heavier portion thus collected, and put on one side for subsequent treatment by the Freiberg process of amalgamation in barrels.

I may here mention that Mr. J. F. Arthur Phillips, one of the first authorities on the treatment of gold and silver ores, states that the mercury that is squeezed from the amalgam, and which is technically called "charged quicksilver," is preferred to the pure metal, as with it amalgamation is found to proceed more rapidly.

The method of treatment I would propose is a combination of the old Freiberg process and the Pan process, and is something similar to the method adopted in Nevada, of which latter an excellent description will be found in Mr. Phillips's book, *The Mining and Metallurgy of Gold and Silver.*

In the first place the ore from the different mines should be divided into two classes: 1. Those that are highly pyritous, like that from the Addison Reef. 2. Those that contain little or no pyrites, like some of the stone from the Golden Age. The first class shall, after dressing and subsequent concentration of the heavier minerals, be treated by the Freiberg process. The second class shall be dressed more or less according to the annexed scheme, whereby the best of the ore, together with the most of the pyrites present, shall be separated from the rest, for subsequent treatment by the Freiberg process; and the remainder, after having been considerably reduced in bulk by judicious dressing, shall be amalgamated in Wheeler pans.

The chief objection to this scheme will be the water required for dressing the ore, but I think a site well situated for access from the mines, and with plenty of water, can be found on the Cataract River, or at all events in the neighbourhood. That such a dressing process is very necessary may be seen from the annexed analysis of two samples of reef material made by Mr. Dixon, F.C.S., &c., and in which are forcibly shown how large a percentage of worthless matter (quartz) is mixed with the valuable ore; while an examination of the stone from the Golden Age Reef would show that there is, besides, a quantity of clay present.

No. 1 sample of stone, from Grand Junction.

Silica	91·765
Antimony	·132
Arsenic	traces
Gold	·011
Silver	·129
Lead	1·492
Copper	·047
Zinc	·477
Iron	2·631
Sulphur	1·552
Water	1·008
Oxygen and loss	·756
	100·000

Giving gold 3 ozs. 16 dwts. 0 grs., silver 42 ozs. 4 dwts. 10 grs. per ton.

No. 2 sample of stone, from Boorook.

Silica	97·710
Antimony	·125
Gold	traces
Silver	·004
Lead	·023
Copper	traces
Iron	·791
Sulphur	·324
Water	·762
Oxygen and loss	·261
	100·000

Giving gold 1 dwt. 14 grs., silver 1 oz. 11 dwts. 5 grs. per ton.

I have appended a drawing showing the construction and working of the dressing machine used in Cornwall (on a very large scale) for dressing slimes. It may be well for the mining public to see it, and it is applicable to Boorook, firstly, on account of the clayey matter in some of the reefs, and secondly in cases where the silver ore occurs as chloride and has the comparatively low specific gravity of 5·5. I have also added a sketch showing a method of extending the grating surface of the stamper box, and which is desirable where it is essential, not to stamp the ore too fine, as is the case at Boorook. The requisite descriptions are appended to the drawings.

It is scarcely necessary to describe in detail the old Freiberg process, and the Pan process of America; accurate and detailed descriptions will be found in most books on metallurgy. Having therefore already mentioned the chief features in the Pan process, I will briefly enumerate the principal points to be attended to in the Freiberg process:—

1stly. The ore to be treated by this process must not contain more than 4 *p. c. of lead, or* 1 *p. c. of copper.*

2ndly. It is necessary to have 34 *p. c. of iron pyrites present,* as calculated from the regulus formed by smelting the ore.

3rdly. The ore should be mixed with 10 *p. c. of salt,* and calcined. This mixture is effected by making alternate layers of ore and salt on the flat top of the calcining furnace, into which it is then charged through a hopper. *The first calcining should* *be very carefully attended to.* A double-bedded furnace is the best, being of such construction that the mineral can be gradually raked from the coolest portion of the upper bed to the hottest, and thence through a hole on to the coolest portion of the lower bed, and ultimately to the hottest portion of the lower bed. The heat should be very carefully applied so as to avoid the clotting of the ore, a mishap to which it is liable on account of the large amount of sulphur present. It should also be borne in mind that *at a strong red heat chloride of silver volatilizes.*

4thly. The once calcined ore must be carefully sifted, so as to separate the clotted portions, if any; these latter being crushed and recalcined with a fresh charge of ore. The sifted portion should be *intimately mixed with from* 2 *to* 3 *p. c. of salt,* and again calcined.

5thly. The twice calcined ore *is ground fine,* in a mill like a flour mill, and then passed through a fine sieve.

6thly. The doubly calcined sifted ore is put into the barrels. The charge for each barrel being 10 cwt. of calcined ore, 3 cwt. of water, and 80 lbs. of wrought iron scraps in pieces as small and regular as possible. In charging, the water is introduced first, then the ore, and finally the iron. The barrels are now set rotating, and a *thorough incorporation of the mass attained;* this is one of the most important points of the process, as the iron reduces the chloride of silver (formed during the calcining) to metallic silver; a process which otherwise the mercury, subsequently added, will have to perform with much loss of mercury in the form of calomel (chloride of mercury). After having been rotating for about two hours, the contents of the barrels are examined, and a proper consistency arrived at, by adding more water, or calcined ore as the case may be.

7thly. Five cwt. of mercury is now added, and the rotation continued for about 18 hours, the barrels revolving about sixteen times a minute. The contents are then examined, and if amalgamation is found to have taken place satisfactorily, the barrels are filled up with water, and after being rotated slowly for about two hours, the amalgam is drawn off, and subsequently the slime, the latter being *carefully washed* to collect small globules of mercury that may be disseminated through the mass. The matter washed away, I should recommend being passed over a slime table.

Briefly recapitulated the chief points are,—

I. That the ore operated on shall not contain much copper pyrites or galena.

II. That the ore shall contain a certain proportion of iron pyrites.

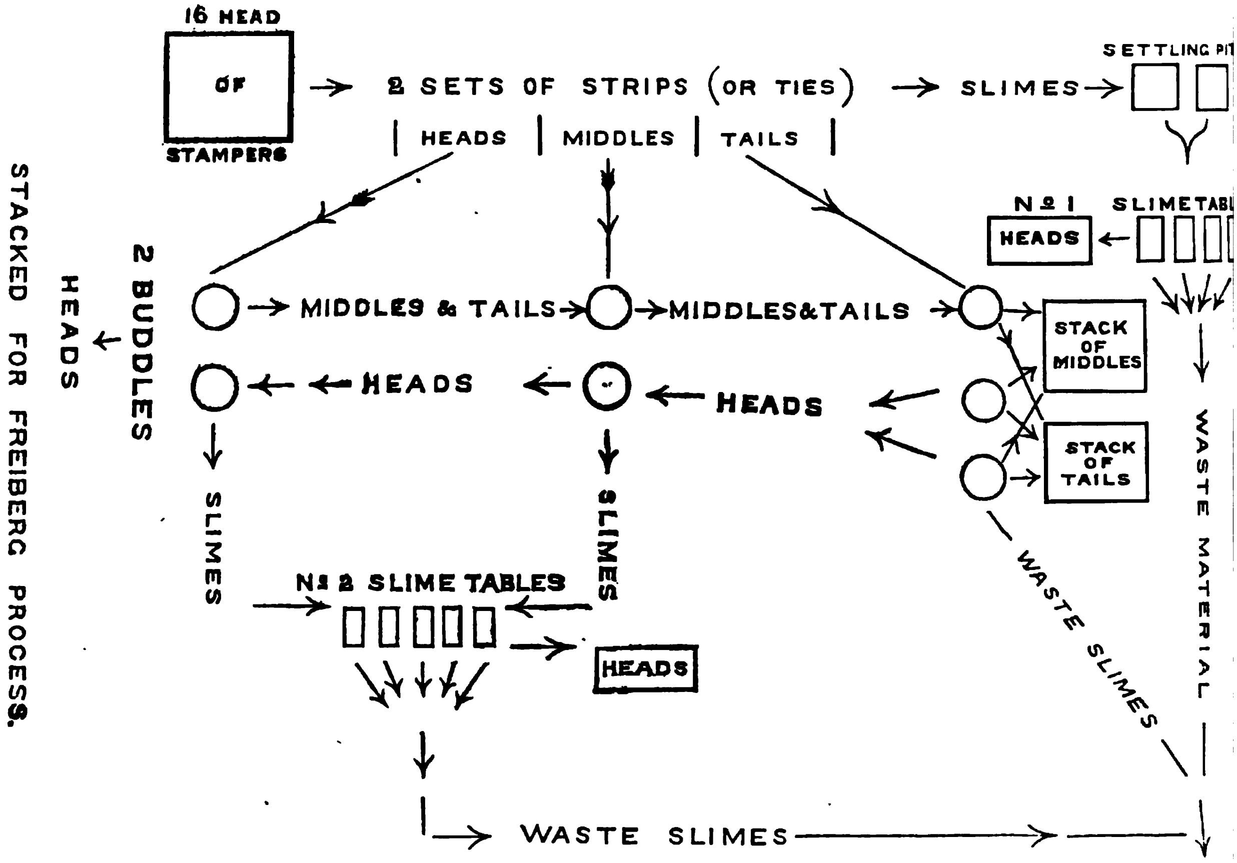
III. Careful calcination.

IV. The quicksilver not to be added till most of the chloride of silver has been reduced by the iron.

V. A proper consistency of the contents of the barrels while amalgamation is taking place

VI. The rate of rotation to be neither so rapid as to cause the quicksilver to stick to the sides of the barrels, nor so slow as to allow it to collect in the lowest portion.

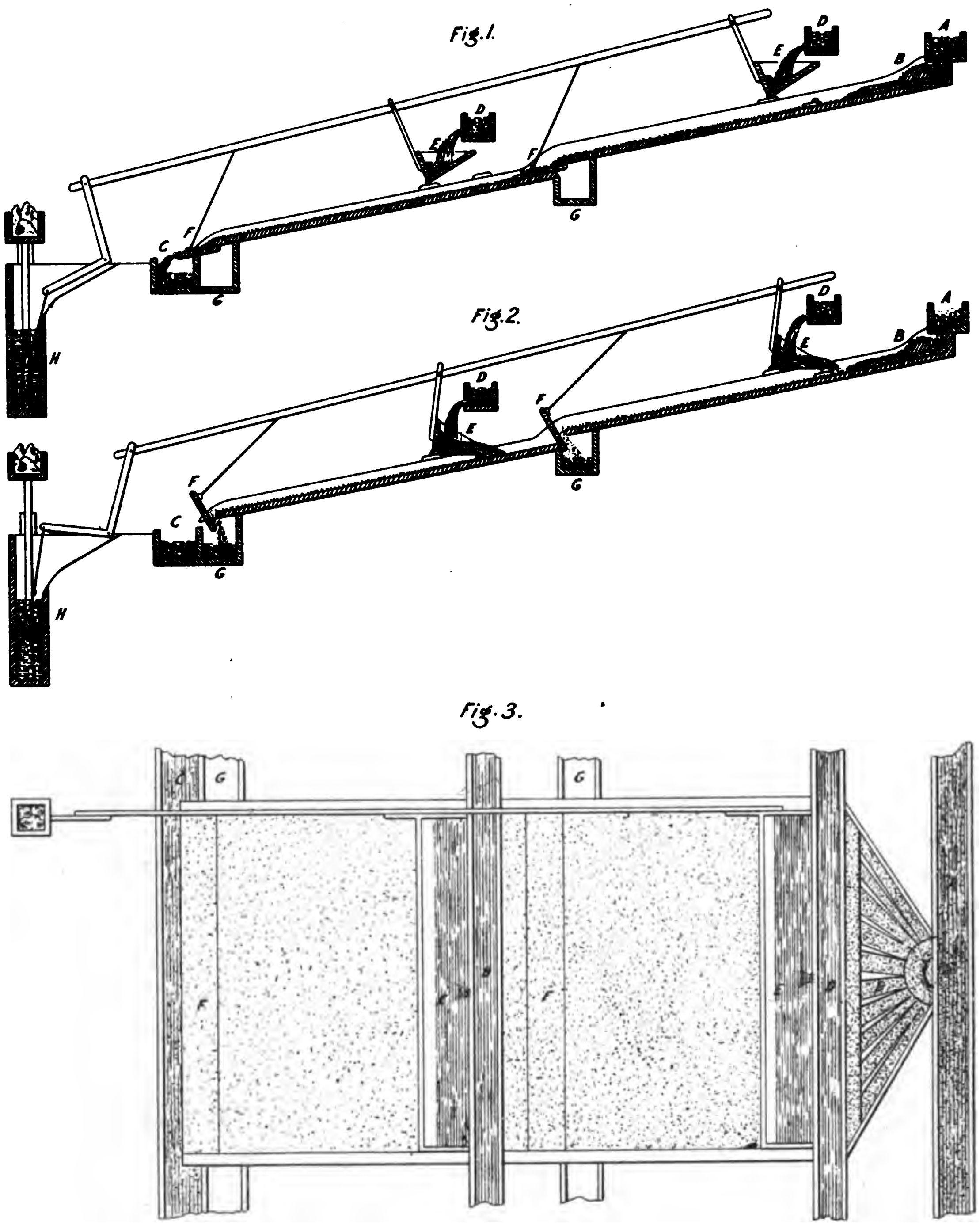
SCHEME FOR DRESSING SECOND CLASS OF ORES.



Explanation.—The ore from the mine is stamped in a battery of 16 head of stampers, whence it is carried by water into two sets of strips (one filling while the other is being emptied), the slimes pass on to the settling pits and ultimately over (No. 1) slime table, the best or "heads" as the mining term is, from these tables are stacked; the remainder may be considered worthless and conducted away. The material deposited in the "strips" (or ties) is divided into three portions; the richest called "heads," the next "middles," and the least valuable "tails." These are sent to three sets of buddles, and so circulated between them that the richest portion continually passes to the left, to be ultimately stacked for the Freiberg process. The poorer portion, consisting of the "middles" and "tails" of the buddles, passes to the right, and is ultimately stacked in two heaps, one of "middles" and the other of "tails." The slime from the first and second set of buddles passes over (No. 2) slime tables, and the "heads" are stacked as in the case of No. 1 slime tables.

The charges for the Wheeler pans are taken from the stacks of No. 1 and No. 2 slime tables, and the stack of "middles" accumulated at the 3rd set of buddles. If found to be rich enough, a portion from the "tails" stack may also be added.

In conclusion, I would advise those extracting silver from the ores, to have analyses made at each step of the process employed; for some slight alterations may have to be made in the amounts of mercury, sulphate of copper, iron, salt, &c., used during the extraction; also, in the length of time allotted to each step of the process. This is always the case with ores from a new district, and by such analyses alone can the requisite details for their treatment be learnt.



Self-Acting Slime Table

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

I would also beg to express my sincere thanks to Messrs. McBride, Moffatt, Horton, and others, and also to the Warden, Mr. Graham, for their kindness, by which I was greatly assisted in my work.

I have, &c.,
LAMONT YOUNG, Assoc. R.S.M.,
Mining Civil Engineer.

14th May, 1879, Oaklands, Mittagong.

DRESSING OF MINERALS.

Self Acting Slime-table.—This dressing machine is, as its name implies, an automatic apparatus used for dressing small particles of crushed material. The principle on which it acts is that of specific gravity, aided by the fact of having to dress material of more or less the same degree of fineness. The slime held in suspension in the water flows along the trough A, until it comes to an opening in the bottom, through which it falls into a little well; this fall serves to agitate the muddy water, and keep all the particles of mineral in suspension. From the well it overflows on to an inclined table, the upper portion of which, B, is provided with a number of wedge-shaped pieces of wood, which spread the muddy water over the whole breadth of the table. As the slime flows down the table, it deposits the heavier particles it has in suspension, on the table; the residue falling into the trough C (which carries it away) may be regarded as worthless if the process has been thoroughly performed. While the slime is thus classifying itself, two V shaped troughs, EE, placed over the inclined table, are being filled with clean water, from troughs, DD; when the V shaped troughs are full, they over-balance, and discharge their contents of (clean water) on to the table, simultaneously two trap-doors in the table, FF, which are suitably connected with the V shaped troughs, are thrown open, and the clean water bearing all the heavier particles (of ore) from the table, flows down and falls through the trap-doors into the troughs GG. The weight of water being withdrawn from EE, the counterpoise H restores them to their original position, and the operation commences afresh. There are two conditions fulfilled by the counterpoise H in a remarkably ingenious and simple manner, namely: a *sudden and complete* discharge of the water in the V shaped troughs, and *keeping the trap-doors open long enough* for the material being washed off the table to enter them. The counterpoise is only a weighted piston working in a well of water; on the lower side of the piston is a leather valve covering several openings through the piston; when the V shaped troughs over-balance the piston rises readily, for this valve is pressed open by the water above it, but when the troughs are recovering their original position, the piston descends slowly, the valve being kept closed by the pressure of water from beneath.

The requisite adjustments as to supply of slime and clean water and the weight on the piston having been once satisfactorily settled, the apparatus requires but little attention. These tables should be placed under cover, and protected from the weather.

Extended Gratings for Stamper-boxes.—The object of the appliances shown in the annexed sketch is twofold. Firstly: To avoid the material being stamped too fine, from its not being able to escape as soon as it has attained the requisite degree of fineness, and secondly, to crush larger quantities of ore by making the process more rapid. The apparatus for this purpose consists of a guard, a large sheet of grating, a retaining frame, and a fastening bar. Fig. 1

shows the guard applied to the opening in the stamper-box. The object of the guard is threefold. Firstly—it gives a support on which to stretch the grating when putting the latter on; secondly—it protects the grating from the violent surging of the water in the box, or the chance blow from a large piece of ore; thirdly—it facilitates the introduction of a piece of grating over any portion of the large sheet that may have become much worn, and which can thus be cut out. Fig. 2 shows the stamper-box with guard, grating, retaining frame, and fastening bar, fixed and in position. Fig. 3 is a section through the stamper-box, showing the projecting wing X of the retaining frame, through which the fastening bar passes. Fig. 4 is a section across the stamper-box, showing the position and extent of the side gratings. In crushing the II class of ores the grating should have from ten to twelve holes to the linear inch.

From the reports furnished by the Warden and others, there can be little doubt that these lodes are not only very rich but extend through a considerable tract of country; and if a thorough examination could be made by a competent geologist it would probably be seen that this district presents an extensive field for the profitable employment of skill and capital.

It will also be seen from the reports how utterly inadequate and inefficient are the appliances at present on the field, hence the comparatively small results yet obtained. Should the necessary skill and capital be brought to bear upon these lodes, I have little doubt that silver will soon form one of the most important of our mineral products.

The quantity of silver exported during the year 1878 amounts to 60,563 ozs., valued at £13,291, consequently the output for that year exceeds that of 1877 in quantity by 29,154 ozs., and in value by £6,618. The total quantity of silver won up to the end of 1878 is 494,942 ozs., valued at £125,430.

Up to the present time very little attention has been paid to lead, and consequently the output is merely nominal. Galena has been found in various parts of the Colony, but the percentage of silver has been too small, or the discoverers have not possessed the skill necessary to work it profitably. The following samples were received and tested during the year:—

No. 19.—*Copper Pyrites, with Oxide of Copper and Arsenical Pyrites, from Bolivia, New England, contained*—

Copper—15·96 per cent.
Silver—31 ozs. 3 dwts. 0 grs. per ton.
Gold—none.
Lead—considerable quantity, not determined.

No. 20.—*Mispickel, from same locality as 19, contained*—

Gold—5 grs. per ton.
Silver—1 oz. 15 dwts. 5 grs. per ton.

As will be seen from the following extract from the report of the Mining Registrar at Vegetable Creek, a new lode has been discovered in that district.

EXTRACT from the report of Mr. G. H. Gower, Mining Registrar at Vegetable Creek.

A lode containing some lead and silver was discovered on the south side of the Severn (8 miles southwesterly from Vegetable Creek), which is also traceable across on the north side of the river by the outcrop on the surface for a distance of half-a-mile. A shaft has been sunk on the lode about 12 feet deep, and at that depth it is found to be about 14 inches wide, with a belt of copper ore running alongside about 8 inches wide, which has, on assay, been found to contain 35 per cent. of copper. The galena returns about 75 per cent. of lead and about 40 ozs. of silver to the ton. The owners have a party of three men at present raising 10 tons of stuff, which they intend to send to Sydney, to obtain a reliable test of the value of the lode.

Extended Gratings for Stamper Boxes

Fig 1.

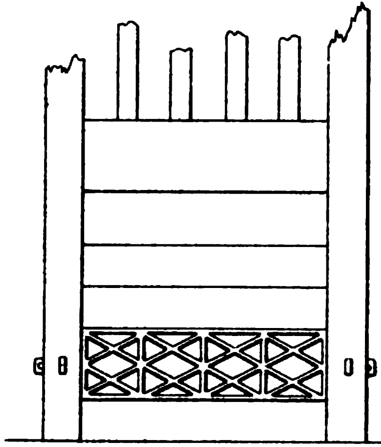


Fig 2.

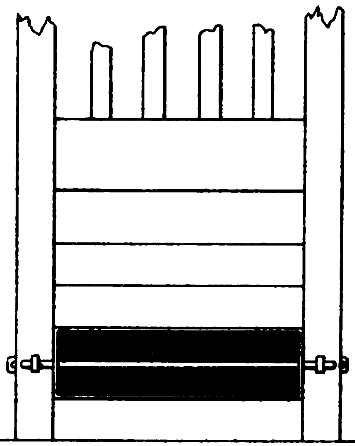


Fig 3.

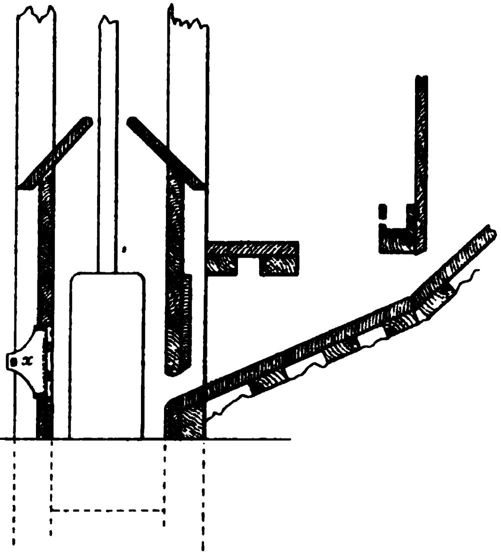


Fig 4.

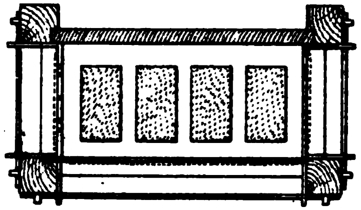


PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

A sample of galena from the Cobar Company's Copper Mine has been tested by Mr. Dixon, with the following result:—

No. 66.—*Galena from Cobar.*

Lead	84·99
Antimony	·30
Silver	·08
Iron	·84
Sulphur	13·95
	100·16

which gives for the proximate constituents—

Sulphide of lead	98·12
,, iron	1·32
,, antimony	·41
,, silver	·09
Sulphur in excess	·22
	100·16

ANTIMONY.

Although this mineral is found in various localities in this Colony, for example, at Tenterfield, Lunatic, Drake, Grafton, Rocky River, Solferino, Nundle, Armidale, Bingera, Macleay and Hastings Rivers, near Mount Mitchell, Booroolong, Gara, Rylstone, Wallerawang, Shoalhaven River, Gundagai, Eden, Twofold Bay, &c., &c., it is not extensively worked.

At Lunatic a mine is being worked, it is said, with profitable results. During the year a sample of ore (stibnite) from Bingera was tested by Mr. Dixon, and found to contain much quartz and iron oxide and 48·9 per cent. of antimony.

The quantity of antimony exported during the year is—Ore, 23 tons; metal, 41 tons; valued at £1,964. This is an increase upon the yield of 1877.

OTHER MINERALS.

A Company at Gundagai opened a mine in that locality and obtained samples of asbestos, but no report has reached me of any quantity having been raised.

Samples of bismuth were forwarded from Tingha for examination, and were tested by Mr. Dixon, with the following results:—

Carbonate of Bismuth.—Waterworn nodules of carbonate and oxide of bismuth, white to dark brown in colour, contained bismuth 60·43 per cent. carbonate of bismuth.

Rolled fragments associated with talc and ferric oxide contained bismuth 62·75 per cent.

No. 8.—*Sand from the sea-coast, near the Richmond River.*

Gold—1 dwt. 5 grs. per ton.
Platinum traces less than 5 grs. per ton.

SUMMARY.

In conclusion, I have the honor to submit a summary of the quantity and value of the various minerals produced, the aggregate value to the 31st December last being £48,611,551 11s. 4d.

	Quantity.	Value.			Total Value.		
		£	s.	d.	£	s.	d.
Quantity and value of gold raised prior to the 1st January, 1878	8,727,636·83 ozs.	32,498,549	0	7			
Quantity and value of gold raised during 1878	119,665·47 „	430,033	2	7			
Totals	8,847,302·30 ozs.	32,928,582	3	2	32,928,582	3	2
Quantity and value of silver raised prior to the 1st January, 1878	434,379 ozs.	112,139	0	0			
Quantity and value of silver raised during 1878	60,563 „	13,291	0	0			
Totals	494,942 ozs.	125,430	0	0	125,430	0	0
Quantity and value of coal raised prior to the 1st January, 1878	17,481,197 tons.	9,137,056	10	10			
Quantity and value of coal raised during 1878	1,575,497 „	920,936	7	4			
Totals	19,056,694 tons.	10,057,992	18	2	10,057,992	18	2
Quantity and value of shale raised prior to the 1st January, 1878	137,299 tons.	371,432	10	0			
Quantity and value of shale raised during 1878	24,371 „	57,211	0	0			
Totals	161,670 tons.	428,643	10	0	428,643	10	0
Quantity and value of tin raised prior to the 1st January, 1878	Ingots 23,789 tons Ore 10,955 „	2,375,950	0	0			
Quantity and value of tin raised during 1878	Ingots 6,085 „ Ore 1,125 „	395,822	0	0			
Totals	....	2,771,772	0	0	2,771,772	0	0
Quantity and value of copper raised prior to the 1st January, 1878	Ingots 20,078 tons 4 cwt. Ore 22,206 „ 16 „ Regulus 474 „ 12 „	1,890,458	0	0			
Quantity and value of copper raised during 1878	Ingots 4,983 „ 0 „ Ore 36 „ 0 „ Regulus 200 „ 0 „	345,158	0	0			
Totals	....	2,235,616	0	0	2,235,616	0	0
Value of iron raised prior to the 1st January, 1878	....	36,935	0	0			
Quantity and value of iron raised during 1878	900 tons.	6,666	0	0			
Totals	....	43,601	0	0	43,601	0	0
Quantity and value of antimony raised prior to the 1st January, 1878	Ore 167 tons 19 cwt. Regulus 142 „ 0 „ Metal 13 „ 13 „	7,168	0	0			
Quantity and value of antimony raised during 1878	Ore 23 „ 0 „ Metal 41 „ 0 „	1,964	0	0			
Totals	....	9,132	0	0	9,132	0	0

SUMMARY—*continued.*

	Quantity.	Value.	Total Value.
		£ s. d.	£ s. d.
Quantity and value of lead raised prior to the 1st January, 1878	87 tons 12 cwt.	1,717 0 0	
Quantity and value of lead raised during 1878	5 „ 0 „	258 0 0	
Totals	92 tons 12 cwt.	1,975 0 0	1,975 0 0
Quantity and value of mixed minerals raised prior to the 1st January, 1878	231 tons	7,725 0 0	
Quantity and value of mixed minerals raised during 1878	77 „	1,082 0 0	
Totals	308 tons.	8,807 0 0	8,807 0 0
TOTAL	....	....	48,611,551 11 4

The aggregate value of the minerals won during the year 1878 amounts to £2,172,421 9s. 11d., which, compared with the decennial average, shows an increase of £43,245.

I have, &c.,

HARRIE WOOD,

Under Secretary for Mines.

Department of Mines, Sydney, 10 July, 1879.

TABLE showing approximately the Number of Miners employed in gold-mining, the quantity of Gold won, the area of ground worked, and the value of Machinery, in the Colony of New South Wales, during the year 1878.

Compiled from Mining Registrars' Returns.

District and Division.	Alluvial Miners.		Quartz Miners.		Total Miners.	Quantity of Gold.									Price of Gold per ounce.		Value of Gold won.			Alluvial ground worked.	Quartz Reefs proved to be auriferous.	Value of Machinery.
	European.	Chinese.	European.	Chinese.		Alluvial.			Quartz.			Total.			From.	To.						
	No.	No.	No.	No.	No.	ozs.	dwts.	grs.	ozs.	dwts.	grs.	ozs.	dwts.	grs.	s. d.	s. d.	£	s.	d.	Square miles.	No.	£
BATHURST DISTRICT—																						
Bathurst Division ...	30	50	12	20	112	100	0	0	90	0	0	190	0	0	70/0	77/6	700	0	0	...	...	...
Trunkey „ ...	40	5	36	...	81	939	5	0	847	0	0	1786	5	0	74/0	74/6	6632	0	0	...	...	17160
Tuena „ ...	25	31	7	...	63	600	0	0	53	0	0	653	0	0	72/0	73/0	2383	9	0	20	15	5500
Carcoar „ ...	8	...	66	...	74	555	0	0	3505	5	0	4060	5	0	...	...	12568	14	0	...	...	25700
Cowra „ ...	20	...	...	...	20	34	0	0	....			34	0	0	74/0	75/0	126	13	0	10	...	...
Rockley „ ...	13	30	...	...	43	322	0	0	....			322	0	0	74/0	75/0	1191	8	0	25	...	420
Orange „ ...	7	...	13	...	20	....			408	0	0	408	0	0	62/6	75/6	1179	2	7	...	...	5000
Mitchell's Creek Division.	15	18	20	...	53	250	0	0	605	0	0	855	0	0	40/0	72/0	2437	3	0	160	10	2000
	158	134	154	20	466	2800	5	0	5508	5	0	8308	10	0	40/0	77/6	27218	9	7	215	25	56280
TAMBAROORA AND TURON DISTRICT—																						
Hill End Division ...	168	257	267	3	695	....			12262	0	8	12262	0	8	77	77/10½	47515	6	3	...	...	47934
Sofala „ ...	201	209	40	...	450	5011	17	6	1012	16	22	6024	14	4	75/0	75/0	22592	3	3	20	30	3350
Ironbarks „ ...	150	50	50	...	250	1194	0	0	1443	0	0	2637	0	0	75/0	75/0	9888	15	0	60	26	3200
	519	516	357	3	1395	6205	17	6	14717	17	6	20923	14	12	75/0	77/10½	79996	4	6	80	56	54484
MUDGEE DISTRICT—																						
Gulgong Division	...	...	30	...	30	1675	8	4	1422	16	0	3098	4	4	75/0	80/6	12000	0	0	...	2	7400
Mudgee „	50	10	...	...	60	4331	19	17	....			4331	19	17	72/6	77/6	16240	0	0	...	...	...
Hargraves „	183	191	...	...	374	1466	12	8	....			1466	12	8	73/0	77/0	5500	0	0	30	4	1200
	233	201	30	...	464	7474	0	5	1422	16	0	8896	16	5	72/6	80/0	33740	0	0	30	6	8600
LACHLAN DISTRICT—																						
Forbes Division ...	100	...	50	...	150	360	13	14	442	17	0	803	10	14	67/6	75/0	2712	8	6	100	25	7000
Parkes „ ...	200	27	10	...	237	3279	19	0	450	0	0	3729	19	0	73/0	76/0	13895	0	0	10	20	6000
Cargo „ ...	28	...	24	...	52	730	0	0	1000	0	0	1730	0	0	74/0	74/0	6400	0	0	2	18	2000
Grenfell „ ...	17	...	39	...	56	650	0	0	1002	5	0	1652	5	0	73/0	76/0	6195	18	9	...	24	5100
Young „ ...	150	30	...	...	180	2143	13	3	....			2143	13	3	76/0	76/0	8145	17	10	...	...	700
	495	57	123	...	675	7164	5	17	2895	2	0	10059	7	17	67/6	76/0	37349	5	1	112	87	20800

TABLE showing approximately the Number of Miners, &c.—*continued.*

District and Division.	Alluvial Miners.		Quartz Miners.		Total Miners.	Quantity of Gold.			Price of Gold per ounce.		Value of Gold won.	Alluvial ground worked.	Quartz Reefs proved to be auriferous.	Value of Machinery.
	Europeans.	Chinese.	Europeans	Chinese.		Alluvial.	Quartz.	Total.	From.	To.				
	No.	No.	No.	No.	No.	ozs. dwts. grs.	ozs. dwts. grs.	ozs. dwts. grs.	s. d.	s. d.	£ s. d.	Square miles.	No.	£
SOUTHERN DISTRICT—														
Braidwood Divison ...	110	50	...	...	160	1176 16 20	....	1176 16 20	73/0	75/0	4500 0 0	10	...	7700
Araluen „ ...	321	92	8	8	429	5100 0 0	358 1 0	5458 1 0	68/0	75/9	20345 0 0	...	...	21040
Major's Creek „ ...	75	8	37	...	120	639 1 5	1158 10 0	1797 1 5	70/0	74/0	6525 15 11	...	20	2765
Little River „ ...	129	97	...	...	226	1904 10 12	25 0 0	1929 10 12	76/6	76/6	7380 8 8	...	40	3113
Nerrigundah „ ...	85	60	16	...	161	1438 4 17	....	1438 4 17	71/0	78/6	5384 6 7	3	9	405
Shoalhaven „ ...	...	...	74	...	74	....	1263 9 3	1263 9 3	61/6	65/0	4106 5 0	1	1	2050
Moruya „ ...	33	...	2	...	35	131 5 9	25 0 0	156 5 9	76/0	77/0	593 2 6	...	2	2000
Bombala „ ...	10	60	...	...	70	469 2 21	....	469 2 21	72/0	75/0	1753 0 3	...	...	...
Nerriga „ ...	16	20	...	...	36	374 0 0	....	374 0 0	75/0	75/0	1402 10 0	...	...	...
Gundaroo „ ...	2	...	20	...	22	12 0 0	54 3 0	66 3 0	76/0	78/0	254 11 7	2	1	...
Bega „ ...	4	...	...	...	4	....	....	....	...	...	....	...	...	...
	785	387	157	8	1337	11245 1 12	2884 3 3	14128 14 15	61/6	78/6	52245 0 6	16	73	39073
TUMUT AND ADELONG DISTRICT—														
Adelong Division.......	150	50	350	...	550	4000 0 0	5910 0 0	9910 0 0	78/0	80/0	40729 4 9	12	24	90000
Tumut „	21	6	...	...	27	258 6 0	....	258 6 0	73/6	75/9	968 11 6	100	...	3500
Tumbarumba „	185	25	40	...	250	2707 0 6	1855 19 12	4562 19 18	...	...	17110 10 0	...	...	...
Kiandra „	35	80	...	...	115	1648 0 0	....	1648 0 0	72/0	73/0	6015 4 0	3	3	2750
Yarrara „	5	20	11	...	36	....	150 14 15	150 14 15	75/9	75/9	571 0 0	...	...	4950
Albury „	...	...	12	...	12	....	600 0 0	600 0 0	...	...	2250 0 0	...	...	400
Queanbeyan „	...	...	3	...	3	....	54 6 0	54 6 0	66/8	70/0	185 0 0	...	...	300
	396	181	416	...	993	8613 6 6	8571 0 3	17184 6 9	66/8	80/0	67829 10 3	115	27	101900

TABLE showing approximately the Number of Miners, &c.—*continued.*

District and Division.	Alluvial Miners.		Quartz Miners.		Total Miners.	Quantity of Gold.			Price of Gold per ounce.		Value of Gold won.	Alluvial ground worked.	Quartz Reefs proved to be auriferous.	Value of Machinery.
	Europeans.	Chinese.	Europeans.	Chinese.		Alluvial.	Quartz.	Total.	From.	To.				
	No.	No.	No.	No.	No.	ozs. dwts. grs.	ozs. dwts. grs.	ozs. dwts. grs.	s. d.	s. d.	£ s. d.	Square miles.	No.	£
PEEL & URALLA DISTRICT—														
Armidale Division......	50	20	......	...	70	90 7 0	....	90 7 0	74/0	75/6	321 19 6	...	...	1000
Uralla "	100	58	......	...	158	930 0 0	....	930 0 0	75/0	75/6	3510 15 0	20	...	...
Nundle "	40	39	118	...	197	1514 0 0	2100 0 0	3614 0 0	72/6	73/0	13100 15 0	...	14	3700
Scone "	...	......	2	...	2	....	15 18 15	15 18 15	72/6	72/6	57 14 0	...	...	...
Barraba "	20	2	17	...	39	500 0 0	655 12 0	1155 12 0	70/0	71/0	4044 0 0	8	3	900
Bingera "	100	7	......	...	107	700 0 0	....	700 0 0	70/0	72/0	2520 0 0	15	...	500
Walcha "	...	......	11	...	11	....	334 12 0	334 12 0	...	...	1230 0 0	...	...	3500
Barrington "	...	...	900	...	900	....	....	9518 0 0	75/0	...	35692 10 0	...	...	...
	310	126	1048	...	1484	3734 7 0	3106 2 15	16358 9 15	70/0	75/6	60477 13 6	43	17	9600
NEW ENGLAND AND CLARENCE DISTRICT.—														
Tenterfield Division	4	...	...	...	4	....	....	100 0 0	64/0	...	320 0 0	...	...	...
Lunatic "	86	29	20	...	135	706 13 0	2009 0 0	2715 13 0	68/0	71/0	9592 0 0	350	...	6000
(Solferino) Lionville Division	38	40	4	...	82	452 18 10	64 13 15	517 12 1	68/0	72/0	1806 6 3	20	21	4795
Ballina Division	5	...	...	...	5	....	....	....	...	...	....	...	...	...
Dalmorton "	12	22	...	...	34	75 0 0	....	75 0 0	75/0	75 0	281 5 0	308	64	5000
	145	91	24	...	260	1234 11 10	2073 13 15	3408 5 1	64/0	75/0	11999 11 3	678	85	15795

Summary.

Compiled from Mining Registrars' Reports.

TABLE showing approximately the Number of Miners employed in gold-mining, the quantity of Gold won, the area of ground worked, and the value of Machinery, in the Colony of New South Wales, during the year 1878.

District and Division.	Alluvial Miners.		Quartz-miners.		Total Miners.	Quantity of Gold.			Price of Gold per ounce.		Value of Gold won.	Alluvial Ground worked.	Quartz Reefs proved to be aurif-erous.	Value of Machinery.
	Euro-peans.	Chinese.	Euro-peans.	Chi-nese.		Alluvial.	Quartz.	Total.	From	To				
	No.	No.	No.	No.	No.	ozs. dwt. grs.	ozs. dwt. grs.	ozs. dwt. grs.	s. d.	s. d.	£ s. d.	Square miles.	No.	£
Bathurst District......	158	134	154	20	466	2800 5 0	5508 5 0	8308 10 0	40/0	77/6	27218 9 7	215	25	56280
Tambaroora and Turon District.	519	516	357	3	1395	6205 17 6	14717 17 6	20923 14 12	75/0	77/10½	79996 4 6	80	56	54484
Mudgee District	233	201	30	...	464	7474 0 5	1422 16 0	8896 16 5	72/6	80/0	33740 0 0	30	6	8600
Lachlan „	495	57	123	...	675	7164 5 17	2895 2 0	10059 7 17	67/6	76/0	37349 5 1	112	87	20800
Southern „	785	387	157	8	1337	11245 1 12	2884 3 3	14128 14 15	61/6	78/6	52245 0 6	16	73	39073
Tumut and Adelong District.	396	181	416	...	993	8613 6 6	8571 0 3	17184 6 9	66/8	80/0	67829 10 3	115	27	101900
Peel and Uralla District.	310	126	1048	...	1484	3734 7 0	3106 2 15	16358 9 15	70/0	75/6	60477 13 6	43	17	9600
New England and Clarence District.	145	91	24	...	260	1234 11 10	2073 13 15	3408 5 1	64/0	75/0	11999 11 3	678	85	15795
	3041	1693	2309	31	7074	48471 14 8	41178 19 18	99268 4 2	40/0	80/0	370855 14 8	1280	376	306532

TABLE showing approximately the Number of Miners employed in mining for minerals other than Gold or Coal at some of the principal mines, the quantity won during the year 1878, and the value of same, and the value of plant.

Locality.	Miners employed.	Quantities.				Value.			Value of Machinery.	Remarks.
		Tin.	Copper.	Iron.	Antimony.					
		Tons.	Tons.	Tons.		£	s.	d.	£	
Bathurst	80	....	1,570	....	....	4,700	0	0	....	Ore.
Rockley	20	....	361	....	....	3,308	16	10	....	
Orange	30	....	520	....	....	4,041	0	0	3,000	
Bingera	4	....	20	....	....	200	0	0	....	
Bourke	400	....	1,468	....	....	88,080	0	0	25,000	
	534	....	3,939	....	....	100,329	16	10	....	
Tenterfield	522	1,107	....	....	....	37,638	0	0	1,830	
Vegetable Creek	694	1,936	....	....	....	60,984	0	0	9,550	
Tingha	500	1,500	....	....	....	45,000	0	0	....	
	1,716	4,543	....	....	....	143,622	0	0	....	
Hartley	50	....	....	430	....	1,505	0	0		

The following information has been obtained by the Wardens and Mining Registrars respecting certain parcels of Wash-dirt which have been puddled, sluiced, or crushed during the year 1878, and the quantity of Gold produced therefrom.

District and Division.	Name of Company.	Locality.	Quantity.	Average yield of Gold per ton.	Total yield of Gold.	Depth of Workings.
			Tons.	ozs. dwts. grs.	ozs. dwts. grs.	
Bathurst District—						
Carcoar Division	Brown's Creek G. M. Co.	Brown's Creek	21,584	0 2 16·60	2,905 5 0	90 ft.
	Halley, Kearney, & Co.	Lumpy Swamp	1,531	0 7 6·00	555 0 0	105 ”
Orange Division	Wallace & Co.	Forest Reefs	600	0 9 20·80	296 0 0	65 ”
			23,715	0 3 4·02	3,756 5 0	
Mudgee Mining District—						
Hargraves	Isaac Slack	Hargraves	1,610	0 0 12·00	40 5 0	Surface.
Lachlan Mining District—						
Forbes Division	Edmond Hey & party	Bald Hills	480	0 13 4·67	316 13 14	210 ft.
Parkes Division	Robt. M'Intyre	Bushman's Lead, Opossum Gully, Sardine Gully, & Welcome Lead	3,650	0 4 0·00	730 0 0	43 to 60 ft.
	Old Millander	Bushman's	4,500	0 3 12·00	787 10 0	from 50 to 115 ft.
		Great Northern	700	0 3 12·00	122 10 0	
		Donald's Gully	95	0 3 0·00	14 5 0	20 to 50 ft.
	J. Mobbs	London	200	0 5 0·00	50 0 0	60 to 100 ”
	J O'Donnell	M'Guigans	200	0 4 0·00	40 0 0	100 to 114 ”
			600	0 1 12·00	45 0 0	”
			300	0 4 0·00	60 0 0	”
			300	0 4 0·00	60 0 0	”
	Brays	Welcome	2,000	0 6 0·00	600 0 0	50 to 100 ”
	”	Richardson's Lead	500	0 4 0·00	100 0 0	60 ft.
		Time will Tell	300	0 3 0·00	45 0 0	90 ”
		Paddy's Flat	500	0 3 0·00	75 0 0	50 ”
	J. Perry	Ben Nevis	1,500	0 3 0·00	225 0 0	90 to 100 ft.
	Pascoe & party	Welcome Lead	360	0 4 0·00	72 0 0	105 to 115 ”
	”	”	419	0 4 18·84	100 5 0	
	E. Draper	Reid's Gully	150	0 5 0·00	37 10 0	100 ft.
	Mann & party	”	200	0 4 0·00	40 0 0	80 to 100 ft.
	”	No Mistake	186	0 4 0·00	37 4 0	90 to 100 ”
	Thos. Bowman	”	100	0 3 2·64	15 11 0	
	J. Nicholson	”	50	0 3 12·00	8 15 0	80 to 100 ft.
	”	”	100	0 3 0·00	15 0 0	

YIELD of Gold from Wash-dirt—*continued.*

District and Division.	Name of Company.	Locality.	Quantity.	Average yield of Gold per ton.	Total yield of Gold.	Depth of Workings.
			Tons.	ozs. dwts. grs.	ozs. dwts. grs.	
LACHLAN DISTRICT—*contd.*						
Grenfell Division	Dodd & Party	Lower Quandong	97½	0 2 14·20	13 0 0	200 ft.
	Doyle & Party	Seven Mile	75	0 10 16·00	40 0 0	84 "
	Burke & Party	"	150	0 8 0·00	60 0 0	106 "
	Parker & Party	"	75	0 6 16·00	25 0 0	84 "
			17,787½	0 4 4·79	3,735 3 14	
SOUTHERN DISTRICT—						
Araluen Division	J. B.	Long Flat	800	0 0 12·00	20 0 0	from 1 to 12 ft.
	J. E. & H. B.	"	750	0 2 3·20	80 0 0	"
	J. B. & D. B.	"	500	0 2 0·00	50 0 0	"
	W. F. & W. S.	"	600	0 3 0·00	90 0 0	"
	H. B. & Sons	"	900	0 2 0·00	90 0 0	"
	J. F.	"	700	0 1 00·0	35 0 0	"
	D. W.	"	1,040	0 0 12·00	26 0 0	"
	J. T. & T. B.	"	1,200	0 0 18·00	45 0 0	"
	O. B. & J. H.	"	1,300	0 0 12·00	32 10 0	"
Little River Division	Sitlick & Co.	Puddling Machine Gully, Little River.	6,000	0 0 12·00	150 0 0	
	Huff & Co.	Little River	4,000	0 0 6·00	50 0 0	1 to 8 ft
	Dunshea & Co.	Red Hill	2,500	0 0 12·00	62 10 0	1 to 6 "
	Gifford & Co.	Sergeant's Point	1,000	0 1 0·00	50 0 0	1 to 12 ft.
	Wisbey & Co.	Mosquito Flat	5,550	0 0 9·00	103 2 12	1 to 10 "
	Hart & Co.	Leache's Point	500	0 4 0·00	100 0 0	
Moruya Division	John Stevens & Party	Silver Mine	120	0 4 4·00	25 0 0	Surface.
			27,410	0 0 17·67	1,009 2 12	

Summary.

QUANTITY of Gold obtained from certain parcels of Wash-dirt puddled, sluiced, &c., during the year 1878, showing the average yield of Gold per ton.

District.	Quartz crushed.		Average yield of Gold per ton.			Total yield of Gold.		
	Tons.	cwt.	ozs.	dwts.	grs.	ozs.	dwts.	grs.
Bathurst District	23,715	0	0	3	4·02	3,756	5	0
Mudgee "	1,610	0	0	0	12·00	40	5	0
Lachlan "	17,787	10	0	4	4·79	3,735	3	14
Southern "	27,410	0	0	0	17·67	1,009	2	12
	70,522	10	0	2	10·13	8,540	16	2

THE following information has been obtained by the Wardens and Mining Registrars respecting certain parcels of Quartz crushed during the year 1878.

District and Division.	Name of Company.	Locality.	Quantity.	Average yield of Gold per ton.	Total yield of Gold.	Depth of Workings.
			Tons.	ozs. dwts. grs.	ozs. dwts. grs.	
BATHURST DISTRICT— Carcoar Division …………	Gally Swamp Quartz Crushing Co. ……………	Gally Swamp, near Carcoar ……………	1,400	0 8 13·71	600 0 0	180 ft.
Orange „ …………	New Phœnix G. M. Co. …	Lucknow ……………	5	5 0 0·00	25 0 0	252 „
	Reform G. M. Co. ………	Do. ……………	60	1 9 0·00	87 0 0	400 „
Mitchell's Creek Division…	Frederick Robertson ……	Mitchell's Creek ……	120	0 9 0·00	54 0 0	15 „
	Curnow & Party …………	Dark Corner…………	106	1 1 12·22	114 0 0	150 „
	Robert Smith & Party……	Mitchell's Creek ……	50	0 14 19·20	37 0 0	40 „
	M. J. Morgan & Party …	Sunny Corner ………	530	0 15 2·26	400 0 0	40 „
			2,271	0 11 14·36	1,317 0 0	
TAMBAROORA AND TURON DISTRICT— Hill End Division …………	Mulholland & Party ……	Prince Alfred Hill …	25½	1 0 0·00	25 10 0	30 ft.
	Bridges & Party …………	Golden Gully ………	64	0 10 0·00	32 0 0	40 „
	Clothier & Party …………	„ ………	35	0 13 0·00	22 15 0	25 „
	Letcher & Party …………	Red Hill ……………	54½	1 10 0·00	81 15 0	160 „
	Jeffree & Party……………	Golden Gully ………	31	6 0 0·00	186 0 0	80 „
	Burns & Party……………	Red Hill ……………	104	0 15 0·00	78 0 0	160 „
	Rolstone & Party…………	„ ……………	43	0 7 0·00	15 1 0	25 „
	John Hill & Party ………	„ ……………	20	0 5 0·00	5 0 0	35 „
	Le Messurrier & Party …	Tambaroora Road …	19	0 17 0·00	16 3 0	27 „
	Pymont & Party …………	Tambaroora ………	8	0 13 0·00	5 4 0	30 „
	Thomas and Party ………	Marshall's line………	2	2 0 0·00	4 0 0	20 „
	Star of Peace ……………	Hawkins Hill ………	500	1 0 0·00	500 0 0	300 „
	Beyer and Holterman's …	„ ………	118	1 0 0·00	118 0 0	135 „
	Frenchman's Tribute ……	„ ………	166	0 15 0·00	124 10 0	200 „
	Khroman's Company ……	„ ………	108	1 0 0·00	108 0 0	150 „
	Cock, Attwood, & Dwyer	„ ………	110	0 18 0·00	99 0 0	135 „
	Cornelian Tribute ………	„ ………	97	0 6 0·00	29 2 0	195 „
	Carrol & Beard's ………	„ ………	89	1 0 0·00	89 0 0	125 „
	Fischer & Beard's ………	„ ………	153	0 16 0·00	122 8 0	190 „
	Cornish Company ………	„ ………	989	0 6 0·00	296 14 0	300 „
	Rapp's Tribute…………	„ ………	24	0 14 0·00	16 16 0	160 „
	Gellard & Party …………	„ ………	3	2 0 0·00	6 0 0	50 „
	Geo. Veir & Party ………	„ ………	4	0 10 0·00	2 0 0	100 „
	Monte Christo……………	„ ………	31	0 16 0·00	24 16 0	120 „
	Clements & Party ………	Prince Alfred Hill …	28	0 14 0·00	19 12 0	25 „

YIELD of Gold from certain parcels of Quartz—*continued.*

District and Division.	Name of Company.	Locality.	Quantity.	Average yield of Gold per ton.	Total yield of Gold.	Depth of Workings.
			Tons.	ozs. dwts. grs.	ozs. dwts. grs.	
TAMBAROORA AND TURON DISTRICT—*contd.*						
Hill End Division—*contd.*	Walker & Party	Hawkins Hill	7	2 10 0·00	17 10 0	35 ft.
	Excelsior	Specimen Gully	299	0 10 0·00	149 10 0	120 ,,
	Paxton's	Hawkins Hill	146	0 18 0·00	131 8 0	150 ,,
	Cornelian	,,	393	0 6 0·00	117 18 0	200 ,,
	Brown's Tribute	,,	86	1 0 0·00	86 0 0	96 ,,
	Prince of Wales	Red Hill	341	0 10 0·00	170 10 0	115 ,,
	Dragon	,,	116	0 11 0·00	63 16 0	90 ,,
	Water Works	,,	343	0 18 0·00	308 14 0	110 ,,
	John Weal & Party	,,	3	0 5 0·00	0 15 0	80 ,,
	Marshall Bros	Tambaroora Road	36	0 10 0·00	18 0 0	90 ,,
	Cook & Party	,,	20	0 5 0·00	5 0 0	20 ,,
	Wade & Party	,,	218	0 13 0·00	141 14 0	200 ,,
Ironbarks Division	Various Parties	Ironbarks, Stony Crk., and Muckerawa.	3,833	0 7 12·00	1,437 7 12	surface to 60 ft.
			8,667	0 10 18·93	4,675 8 12	
MUDGEE DISTRICT—						
Gulgong Division	Mitchell's Creek Co.	Mitchell's Creek	2,245	0 12 0	1,347 0 0	200 to 230 ft.
LACHLAN DISTRICT—						
Parkes Division	Bonnie Dundee	Parkes	444	1 0 6·48	450 0 0	140 to 150 ft.
Forbes ,,	Foster's Rf. G. M. Co.	Lake Cudgellico	1,099	0 7 0·00	384 13 0	195 ,,
			1,543	0 10 19·64	834 13 0	
SOUTHERN DISTRICT—						
Araluen Division	Various Mines	Bell's Creek	372	0 19 6·00	358 1 0	surf. to 80 ft.
Major's Creek Division	H. H. R. & Party	Red Hill	47	0 4 0·00	9 8 0	30 ft.
	A. & J. W. Brothers	,,	430	0 3 19·81	82 5 0	,, ,,
Nowra ,,	Portion 11	Big Hill	117	1 1 0·61	123 0 0	
	,, ,,	,,	100	0 9 0·00	45 0 0	
	,, 14	,,	100	0 13 9·60	67 0 0	
	,, ,,	,,	96	0 14 9·00	69 0 0	
	,, ,,	,,	106	0 9 10·41	50 0 0	
		Pinnacle	646	1 0 21·28	674 13 0	
Gundaroo ,,	Dawson Bros.	Diamond Hill, Brook's Creek.	8¼	6 10 6·18	54 3 0	48 ft.
			2,022¼	0 15 3·74	1,532 10 0	

YIELD of Gold from certain parcels of Quartz—*continued.*

District and Division.	Name of Company.	Locality.	Quantity.	Average yield of Gold per ton	Total yield of Gold.	Depth of Workings.
TUMUT AND ADELONG DISTRICT—			Tons. cwt.	ozs. dwts. grs.	ozs. dwts. grs.	
Adelong Division	Challenger G. M. Co.	Old Hill, Adelong	117 10	1 15 9·49	207 19 0	490 ft.
	Flagstaff „	Victoria Reef „	64 0	2 4 16·50	143 0 0	810 „
	Victoria Research Co.	„ „	160 0	0 18 18·00	150 0 0	400 „
	Barr & Party	Cump Reef	9 0	1 7 21·33	12 11 0	Surface to 40
	Casperson & Party	Narrandra	8 0	1 9 3·00	11 13 0	„ 20
	Bird & Party	Gap Reef	5 10	0 3 10·90	0 19 0	„ 150
	Perkins	Gibraltar Hill	20 0	0 18 10·80	18 9 0	„ 30
	Small parties	Donkey Hill	96 12	0 13 8·62	65 13 0	„ 60
	Trudgeon & Co.	Caledonian Reef	18 0	0 17 5·33	15 10 0	190 ft.
	Great Victoria	Adelong	432 0	0 4 15·50	100 7 0	810 „
	Williams	„	301 0	0 14 15·78	220 11 23	735 „
	Annetts & Co.	„	1,412 6	1 12 12·01	2,295 6 0	770 „
	Louisa G. M. Co.	„ Donkey Hill	8 0	0 13 6·00	5 6 0	35 „
	Verschner G. M. Co.	„ „	15 0	0 18 16·00	14 0 0	60 „
	North Caledonian	Williamstown Flat	100 0	0 18 0·00	90 0 0	300 „
	Endeavour G. M. Co.	Camp-street, Adelong	9 6	1 6 16·93	12 11 15	60 „
	Extended Victoria	Fletcher's Reef	274 4	0 13 16·53	187 13 12	200 to 300 ft.
	Currajong G. M. Co.	Currajong Reef	100 10	3 14 0·95	372 1 12	160 & 180 ft.
	Great Victoria G. M. Co.	Victoria Reef	318 0	1 1 15·28	344 0 12	400 & 800 ft.
	Adelong United G. M. Co.	Old Victoria Reef	535 0	1 13 8·42	892 2 21	300 & 600 ft.
Yarrara Division	Albury Pros. Association	Four-mile Creek	357 0	0 8 10·66	150 14 15	70 „
	Day & Martin	Pioneer	28 0	0 4 4·92	5 17 18	30 „
Albury „	Black Range G. M. Co.	Black Range	600 0	1 0 0·00	600 0 0	140 „
Queanbeyan „	Maguire, Devlin, & Anor.	Micalago Creek	40 0	1 7 3·60	54 6 0	100 „
Tumbarumba „	Pilot Reef Co.	New Meragle Creek	600 0	0 13 8·42	400 10 12	140 ft.
	George Nagel & Co.	„	290 0	0 17 22·34	260 0 0	120 „
	Peep-o'-Day G. M. Co.	Ournie	244 0	1 16 15·34	447 0 0	160 „
	Isabella	„	352 0	1 0 3·13	354 6 0	146 „
	Do.	„	142 10	2 5 13·89	324 15 0	„
	Tunnel, or No. 8 Isabella line.	„	130 0	2 8 4·61	313 5 0	70 „
			6,787 8	1 3 9·07	8,070 9 20	

YIELD of Gold from certain parcels of Quartz—*continued*

District and Division.	Name of Company.	Locality.	Quantity.		Average yield of Gold per ton.			Total yield of Gold.			Depth of Workings.
			Tons.	cwt.	ozs.	dwts.	grs.	ozs.	dwts.	grs.	
PEEL AND URALLA DISTRICT											
Barraba Division	Crowley & Co.	Crow Mountain	50	0	1	4	0·00	60	0	0	15 ft.
	Fletcher & Co.	"	215	0	2	10	4·46	539	10	0	20 "
	Quin & Co.	"	35	0	1	12	0·00	56	0	0	12 "
Walcha "	The Golden Star Co.	Glen Morrison	47	10	5	9	11·36	260	0	0	130 "
	Maloney & Party	"	55	0	1	6	4·36	72	0	0	65 "
	Tia Reef	Tia	2	0	1	5	0·00	2	10	0	60 "
Nundle "	Wheal Prosper G.M.Co.	Foley's Folly	300	0	0	9	1·60	136	0	0	150 "
	J. Pateys & Bakewell	Brown Snake Reef	37	0	2	3	5·83	80	0	0	90 "
	A. Shorter & Party	Black "	25	0	2	16	0·00	70	0	0	10 to 75 ft.
	G. Bond & Party	Quackanacca	23	0	1	0	0·00	23	0	0	70 ft.
	J. Brayshaw & Party	Hanging Rock	5	0	1	0	0·00	5	0	0	20 "
	J. P. Robertson	Foley's Reef, Bowling Alley Point.	185	0	0	4	8·43	40	5	0	100 "
	Hans, Wilkins, & Party	Opossum Reef, Bowling Alley Point.	30	0	2	0	0·00	60	0	0	30 "
Barrington "	Prospectors Claim, Rainbow Reef.	Back Creek	97	0	1	10	0·00	145	10	0	
	No. 1 Rainbow Reef	"	58	0	2	0	0·00	116	0	0	
	Pros. Claim, Lord of the Hills Reef.	"	10	0	1	0	0·00	10	0	0	
	No. 1 Mechanics Reef	"	135	0	2	15	0·00	371	5	0	
	Pros. Claim, Rainbow Reef	"	21	0	5	0	0·00	105	0	0	
	do. Mechanics Reef	"	9	0	5	0	0·00	45	0	0	
	No. 1 Lord of Hills Reef	"	33	0	0	15	0·00	24	15	0	
	Star of the South Reef	"	9	0	1	10	0·00	13	10	0	
	Sawyers Reef	"	12	0	0	12	0·00	7	4	0	
	Mountain Maid Reef	"	82	0	15	18	0·00	1,303	16	0	
	No. 1 Morning Star	"	18	10	2	0	0·00	37	0	0	
	Pros. Claim, Morning Star Reef.	"	19	10	1	10	0·00	29	5	0	
	No. 1 Morning Star Reef	"	16	0	2	10	0·00	40	0	0	
	Pros. Claim, Rainbow Reef	"	56	0	1	0	0·00	56	0	0	
	No. 1 Rainbow Reef	"	23	0	1	5	0·00	28	15	0	
	Rosetta Reef	"	26	0	0	18	0·00	23	8	0	
	No. Mechanics Reef	"	129	8	3	14	0·00	479	10	0	
	Pros. Claim, Rainbow Reef	"	15	0	6	0	0·00	90	0	0	
	do. Mountain Maid Reef	"	153	0	15	15	0·00	2,409	15	0	

YIELD of Gold from certain parcels of Quartz—*continued.*

District and Division.	Name of Company.	Locality.	Quantity.	Average yield of Gold per ton.	Total yield of Gold.	Depth of Workings.
PEEL AND URALLA DISTRICT—*continued.*			Tons. cwt.	ozs. dwts. grs.	ozs. dwts. grs.	
Barrington Division—*contd.*	Pros. Claim, Mechanics Reef.	Back Creek	75 0	1 16 0·00	135 0 0	
	Cameron & Party (Hidden Treasure Reef).	"	100 0	3 0 0·00	300 0 0	
	Centennial Reef	"	147 0	2 0 0·00	294 0 0	
	Lukey, Young, & Party (Golden Crown Reef).	"	48 0	3 10 0·00	168 0 0	
	Lady Belmore	"	84 0	3 0 0·00	252 0 0	
			2,385 18	3 5 20·71	7,888 18 0	
NEW ENGLAND & CLARENCE DISTRICT.						
Lunatic Division	Smith, May & Co.	Lunatic Reef, Drake...	45 0	2 15 13·33	125 0 0	90 ft.
	Pioneer Quartz M. Co. ...	Upper Tooloom	34 0	1 19 19·05	67 13 0	195 ft.
			79 0	2 8 18·53	192 13 0	

Summary.

QUANTITY of Gold obtained from certain parcels of Quartz, crushed during the year 1878, showing the average yield of Gold per ton.

District.	Quartz crushed.	Average yield of Gold per ton.	Total yield of Gold.
	Tons. cwt. qrs.	ozs. dwts. grs.	ozs. dwts. grs.
Bathurst District..	2,271 0 0	0 11 14·36	1,317 0 0
Tambaroora and Turon District	8,667 0 0	0 10 18·93	4,675 8 12
Mudgee District	2,245 0 0	0 12 0·00	1,347 0 0
Lachlan District	1,543 0 0	0 10 19·64	834 13 0
Southern District	2,022 5 0	0 15 3·74	1,532 10 0
Tumut and Adelong District	6,787 8 0	1 3 9·07	8,070 9 20
Peel and Uralla District..................................	2,385 18 0	3 5 20·71	7,888 18 0
New England and Clarence District....................	79 0 0	2 8 18·53	192 13 0
	26,000 11 0	0 19 5·73	25,858 12 8

TABLE showing the width, dip, and strike of Quartz Reefs, in some of the deepest Mines in the Colony, being worked during the year 1878, and the average yield of Gold per ton.

District.	Division.	Name of Company.	Name of Reef.	Depth at which Quartz was got.	Quantity crushed.	Average yield of Gold per ton.			Width of Reef.	Dip of the Reef (from the horizon).	Strike of the Reef (bearing.)
				Feet.	Tons.	ozs.	dwts.	grs.			
Bathurst	Carcoar	Gally Swamp Quartz Crushing Co.	Gally Swamp	180	1,400	0	8	13·71	18 to 12 in.	West.	N.W. & S.E.
	Orange	New Phœnix G. M. Co.	Lucknow	252	5	5	0	0·00	1 in. to 3 ft.	....	E. & W.
		Reform G. M. Co.	,,	400	60	1	9	0·00	....	Easterly.	E. & W.
	Mitchell's Creek	Fredk. Robertson	Mitchell's Creek	15	120	0	9	0·00	20 ft.	....	N.
		Curnow and Party	Dark Corner	150	106	1	1	12·22	9 in.	....	N. & S.
		Robert Smith and Party.	Mitchell's Creek	40	50	0	14	19·20	10 in.	....	E & W.
		M. J. Morgan and Pty.	Sunny Corner	40	530	0	15	2·26	2 to 10 ft.	Flat Reef	N. & S.
Tambaroora and Turon.	Hill End	Excelsior	Excelsior, Specimen Gully.	120	299	0	10	6·00	6 in.	....	....
		Paxton's	Hawkins Hill	150	146	0	18	0·00	....	....	....
		Cornelian	,,	200	393	0	6	0·00	3 in.	....	....
		Prince of Wales	Red Hill	115	341	0	10	0·00	....	....	....
		Water Works	,,	110	343	0	18	0·00	7 in.	....	....
		Wade and Party	Tambaroora Road	200	218	0	13	0·00	1 ft.	....	....
		Letcher and Party	Red Hill	160	54⅓	1	10	0·00	....	....	....
		Burns and Party	,,	160	104	0	15	0·00	....	....	....
		Star of Peace	Hawkins Hill	300	500	1	0	0·00	10 in.	....	....
		Beyers & Holtermann	,,	135	118	1	0	0·00	4 in.	....	....
		Frenchman's Tribute	,,	200	166	0	15	0·00	18 in.	....	....
		Krohmann's Co.	,,	150	108	1	0	0·00	5 in.	....	....
		Cock, Attwood, & Dwyer	,,	135	110	0	18	0·00	....	....	....
		Cornelian Tribute	,,	195	97	0	6	0·00	2 ft.	....	....
		Carroll and Beard	,,	125	89	1	0	0·00	....	....	....
		Fischer & Beard	,,	190	153	0	16	0·00	....	....	....
		Cornish Co.	,,	300	989	0	6	0·00	6 ft.	....	....
		Rapp's Tribute	,,	160	24	0	14	0·00	....	....	....
		G. Veir and Party	,,	100	4	0	10	0·00	....	....	....
		Monte Christo	,,	120	31	0	16	0·00	....	....	....
Mudgee	Gulgong	Mitchell's Creek Co.	Mitchell's Creek	230	2,245	0	12	0·00	....	....	....
Lachlan	Parkes	Bonnie Dundee, No. 1, N.	Parkes	140	444	1	0	6·48	2 ft. 6 in.	West	N. & S.
	Forbes	Foster's Reef G. M. Co.	Foster's	195	1,099	0	7	0·00	3 to 6 ft.	1 in 10 ft.	N.E.
Southern	Gundaroo	Dawson Bros.	Hidden Treasure	20	8½	6	10	6·18	3 to 20 in.	E. 1 in 8 ft.	N. & S.
Tumut and Adelong.	Adelong	Challenger G. M. Co.	Old Hill, Adelong	490	117½	1	15	9·49	1 ft.	1 in 10.	10° W. of N.
		Flagstaff G. M. Co.	Victoria Reef, do.	810	64	2	4	16·50	From 1 to 3 ft.	East	11½° E. of S.
		Victoria Research	,,	400	160	0	18	18·00	From 3 to 12 in.	E. 85° 15′ 20″	10° W. of N.
		Trudgeon & Co.	Caledonian Reef	190	18	0	17	5·33	1 ft. 6 in.	E. 18 in. in 6 ft.	N. & S.
		Great Victoria	Adelong	810	432	0	4	15·50	4 to 8 in.	....	6° W. of N.
		Williams	,,	785	301	0	14	15·78	12 in.	....	11½° W. of N.
		Annett's	,,	770	1,412⅒	1	12	12·01	2 to 3 ft.	East.	N. & S.
Peel and Uralla	Walcha	Golden Star Co.	Glen Morrison	130	47½	5	9	11·36	....	....	....
	Nundle	Wheal Prosper G. M. Co.	Foley's Folly	150	300	0	9	1·60	....	....	....
New England and Clarence	Lunatic	Smith, May, & Co.	Lunatic Reef	90	45	2	15	13·33	6 in to 1 ft.	....	N. & S.
		Pioneer Quartz M. Co.	Upper Tooloom	196	34	1	19	19·05	9 in.	25° N.	N. W. & S. E.

TABLE showing approximately the Machinery employed in Gold and Tin Mining during the year 1878.

District and Division.	Quartz.								Alluvial.													
	Steam-engines employed in Winding, Crushing, &c.		Crushing Machines.	Stamp-heads.	Whims and Pulleys.	Water-wheels.	Derricks.	Whips.	Steam-engines employed in Winding, Pumping, &c.		Puddling Machines.	Whims and Pulleys.	Whips.	Quicksilver, as Compound Cradles.	Sluices and Toms.	Water-wheels.	Hydraulic Hoses.	Pumps.	Sluice Boxes.	Derricks.	Stamp Heads.	Boring Machines.
	No.	Aggregate horse-power.							No.	Aggregate horse-power.												
BATHURST DISTRICT—																						
Bathurst	3	40	3	35	5	...	...	...	...	......	4	6	...	...	...	...	...	...	...	...	...	...
Trunkey	1	100	3	79	...	1	...	...	...	......	3	...	...	...	...	...	...	...	...	...	...	...
Tuena	3	49	3	39	...	...	...	...	...	......	...	...	...	...	18	3	...	3	20	...	...	...
Carcoar	3	68	3	35	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Cowra	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Oberon	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Rockley	1	6	1	6	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Orange	4	100	4	28	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Mitchell's Creek	3	24	3	13	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
TAMBAROORA AND TURON DISTRICT—																						
Hill End	18	294	12	123	...	...	...	...	...	......	1	...	...	...	...	2	...	...	20	...	...	...
Sofala	6	90	6	42	...	...	...	...	...	......	8	...	...	...	...	17	...	17	...	...	...	...
Ironbarks	4	40	4	47	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
MUDGEE DISTRICT—																						
Gulgong	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Mudgee	1	16	2	12	...	1	...	...	...	......	6	4	10	...	10	2	...	2	10	...	...	...
Wellington	3	70	2	35	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Hargraves	2	18	2	17	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Rylstone	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
LACHLAN DISTRICT—																						
Forbes	2	37	2	33	...	...	...	...	1	20	...	1	...	...	...	...	...	...	...	...	...	...
Parkes	4	63	1	15	...	...	...	...	..	......	...	...	...	...	...	...	...	...	...	...	...	...
Cargo	1	25	1	15	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Grenfell	5	60	5	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Young	1	16	1	10	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
SOUTHERN DISTRICT—																						
Braidwood	...	......	...	...	...	...	...	...	...	......	...	...	...	... ...	10	5	...	40	50	...	...	...
Araluen	2	20	3	28	...	1	...	...	6	75	...	2	...		...	10	4	20	...	...	...	...
Major's Creek	4	38	4	25	...	...	...	...	...	......	11	...	...	...	...	...	...	...	...	...	...	...

TABLE showing Machinery, &c.—*continued.*

District and Division.	Quartz.								Alluvial.													
	Steam-engines employed in Winding, Crushing, &c.		Crushing Machines.	Stamp-heads.	Whims and Pulleys.	Water-wheels.	Derricks.	Whips.	Steam-engines employed in Winding, Pumping, &c.		Puddling Machines.	Whims and Pulleys.	Whips.	Quicksilver as Compound Cradles.	Sluices and Toms.	Water-wheels.	Hydraulic Hoses.	Pumps.	Sluice Boxes.	Derricks.	Stamp Heads.	ng Mach nes.
	No.	Aggregate horse power.							No.	Aggregate horse power.												
SOUTHERN DISTRICT—*contd.*																						
Little River	2	......	1	10	...	...	...	...	...	......	...	...	...	...	...	10	...	10	930	...	...	...
Nerrigundah	1	4	1	4	...	...	...	...	...	......	...	...	...	...	...	1	...	1	...	...	...	...
Shoalhaven	3	24	4	30	...	2	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Moruya	1	16	1	...	...	...	...	...	...	......	1	...	...	...	...	...	...	...	...	...	...	...
Gundaroo	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Gunning	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
TUMUT AND ADELONG DISTRICT—																						
Adelong	5	74	2	30	4	...	...	2	1	......	...	...	...	...	...	1	...	1	...	...	...	...
Reedy Flat	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Tumut	1	10	...	...	...	...	...	...	...	......	...	...	...	...	2	...	...	...	...	...	...	...
Gundagai	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Yass	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Tumbarumba	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Kiandra	...	......	...	...	...	...	...	...	1	40	1	...	...	...	...	1	...	...	...	...	...	...
Yarrara	3	70	...	...	1	...	...	1	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Albury	1	......	1	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Queanbeyan	...	......	1	5	...	1	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
PEEL AND URALLA DISTRICT—																						
Armidale	1	8	1	8	...	...	...	...	1	6	...	...	...	...	...	...	...	1	...	...	...	...
Uralla	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Nundle	1	15	...	...	...	4	...	...	...	......	...	1	...	...	...	...	...	...	...	...	...	...
Scone	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Bingera	...	......	...	...	...	...	...	...	1	15	...	...	...	...	...	...	...	...	...	...	...	...
Barraba	2	14	2	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Tingha	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Walcha	1	20	1	15	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Barrington	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
NEW ENGLAND AND CLARENCE DISTRICT—																						
Tenterfield	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Little River	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Solferino	2	25	5	40	1	2	...	2	...	......	...	...	...	...	1	...	...	1	...	...	...	...
Ballina	...	......	...	...	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Lunatic	2	12	4	7	...	2	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Dalmorton	1	30	1	10	...	...	...	...	...	......	...	...	...	...	...	...	...	...	...	...	...	...
Wilson's Downfall	...	......	...	...	...	...	...	...	2	8	...	...	...	...	...	...	...	3	...	...	...	...
Vegetable Creek	...	......	...	...	...	...	...	...	10	99	...	...	...	...	...	...	...	...	...	...	...	...

The foregoing tables have been compiled from information supplied by the Wardens and Mining Registrars.

WARDENS' REPORTS.

BATHURST DISTRICT—BATHURST, OBERON, ROCKLEY, TRUNKEY, AND TUENA DIVISIONS.

(Mr. Warden T. A. Smith, Trunkey.)

IN forwarding you my report for the year 1878, I have the honor to state that mining in the Bathurst Division of the Western Gold-field has not been satisfactory during the year. With the exception of the sub-districts of Trunkey and Rockley very little gold or copper has been obtained. The following are the detailed particulars :—

Trunkey.—Alluvial mining has not been during the year prosecuted with vigour. In the early part of the year, water was very scarce; in June it was more plentiful—sluicing operations began afresh that had been suspended for many months for want of water; the country not having been saturated for three years the soakage did not continue long, the creeks soon became dry, the sluicing was again consequently suspended. Since June the water has been in very limited supply, materially affecting the yield of gold, which probably did not exceed 953 ozs. 9 dwts. 19 grs., purchased by the Trunkey storekeepers during 1878. This does not include the gold obtained by Chinese, who usually sell to a countryman storekeeper, "Ah Chong," who deals direct with his countrymen in Sydney, into whose hands the gold passes for goods. I think in this way the total yield of alluvial may be estimated at about 1,200 ozs. derived from all sources within the Trunkey Gold-field.

Reefing, however, seemed to be in a much more healthy condition, though the number of men employed was very limited, there being room for 100 men to work the reefs facing the village, and as many more could set in on Spak's Hill, and I believe, if experienced in mining, and inclined to work, could do well—at least making full wages, certainly not less, on an average, than £2 a week per man. The number of men working these reefs was twenty-eight; the quartz raised by them (702 yards) yielding 807 ozs. melted gold.

Rockley.—The only matter worthy of notice on this field is the opening of the Thompson's Creek Copper Mine, situated about 18 miles from Rockley. The ore is at present carted to Cow-flat by bullock teams, at 35s. a ton. This is a serious item, and no doubt will soon be remedied by the erection of furnaces on the ground. I am informed that the prospects of this mine at present are highly encouraging.

Oberon.—This field is deserted, but I have no doubt some day payable alluvial deposits will be found under the extensive basalt ranges so frequently to be met with in these parts. I am very sanguine that payable copper will be found about here also.

Tuena.—Very little mining, merely fossicking on this field. The Peelwood Copper Mine ceased working a year ago, and remained closed ever since. The reefs about Junction Point have not been worked with success, and are almost abandoned.

Bathurst.—No new discoveries have been made either in copper or gold; the old copper mines are, however, active. At Mitchell's Creek, Cheshire's Creek, and the intermediate country a few persons still continue to mine, but the prospects are not very encouraging.

Taking all things into consideration I do not think mining is at this date as profitable an employment as it was a year ago, but at the same time I believe that on the Trunkey reefs, miners could do as well as anywhere in the Colony. Those miners who have been working here during 1878 have had no cause to complain.

Report of Messrs. James Russell & Co. upon the Thomson's Creek Copper Mines.

We commenced on the 3rd January last, with two men, and now employ thirty-three men, including teamsters.

We beg to say that Clarke's shaft is sunk to a depth of 62 feet. The lode in this shaft is about 8 feet wide from the bottom to near the surface, of about 20 per cent. ores. The lode is disordered at the bottom of this shaft, this being the place of junction with an east and west and north and south lodes; lode going south from this shaft is about 4 feet wide, of black and yellow ore, and is continuous to No. 1 shaft north.

No. 1 shaft north is 40 feet deep, the lode being from 2 to 3 feet wide, of yellow ore. Other prospecting has been done further north with good prospects.

From Clarke's shaft we have a drive near the bottom going east; lode about 8 feet wide, of yellow ore, and going towards No. 1 east.

No. 1 east is sunk to a depth of 57 feet, in which is a strong lode of sulphurets. At the eastern end of this shaft we have rich red oxide of copper; the last parcel sold gave a produce of 43½. We have now a small parcel in transit from this place which we expect will surpass the last; this rich ore is dipping east towards No. 2.

No. 2 shaft is sunk 60 feet. There is a good lode of yellow ore at the bottom of this shaft; at the level going east at this shaft there is another intersection with a north and south lode which is likely to be bunchy. We have let the north end of this level at 11s. out of the £; also the back of the level going south and east, at the same rate. From this shaft we have communication through to No. 3 shaft.

No. 3 shaft is sunk to a depth of 60 feet. At the bottom of this shaft the lode is fully 5 feet wide, and the level driven east 5 fathoms, and sloping commenced. The lode in the end of ground from 4 to 5 feet wide, of from 22 to 26 per cent. ores.

We have also let a pitch 200 yards east of this shaft with good prospects.

The drive coming up from Clarke's shaft going east is below Nos. 1, 2, and 3 shafts, and when under No. 3 shaft will be fully 20 feet deeper than that shaft, and 15 feet deeper than No. 2, and 4 feet deeper than No. 1 shaft, which is now bidding fair for the future of this mine.

These lodes are embedded in gneiss and argillaceous slate, and are cupriferous for a considerable distance north and south.

Bathurst District—Orange Division.

(Mr. Warden Lane, P.M., Orange.)

There is very little doing in connection with the mining interests in this district.

At Ophir there are a few miners at work, some of whom have recently done pretty well; so also have some men who are working near the Macquarie, a few miles north of Ophir.

With the exception of these two places, I have no "finds" to report.

My opinion of Ophir is unaltered. If skill and capital were employed, I believe the results would surprise the world.

Bathurst District—Carcoar Division.

(Mr. Warden E. J. C. North, P.M., Carcoar.)

I have the honor to report that during the past year gold-mining operations have not been very extensively carried on in my division of the Bathurst Mining District, there having been but few persons engaged in that occupation during the period mentioned. Nevertheless the escort returns show a considerable increase in the quantity of gold obtained in 1878 over what was obtained in 1877, the total forwarded in 1877 being 3,043 ozs., as against 4,666 ozs. 10 dwts. in 1878; and taking into consideration the facts that in the early part of the year, until the breaking up of the late drought, scarcely any gold was obtainable, and that since then but few parties have been engaged in the work, the results must be considered highly satisfactory.

Of the quantity of gold produced, the Brown's Creek Gold-mining Company's claim at Brown's Creek yielded more than one-half, the balance being principally from Lumpy Swamp, The Forest, Flyer's Creek, and Gally Swamp, in each of which places the few parties at work seem well satisfied with the return made for their labour.

The new proprietors of the Prince of Wales claim, at Burnt Yards, after working for a short time, found the expenses heavier than they anticipated, and closed the mine; but I have no doubt if a strong company were formed who could afford to thoroughly test the mine, the Prince of Wales would be found to maintain its old reputation of being one of the richest mines in New South Wales.

At Woods Flat, in the Cowra District, little has been doing. One or two parties have been engaged in prospecting in that locality, and on 21st November last Lawrence and party reported having discovered payable gold at a depth of 90 feet, the yield being 10 dwts. to the load.

M'Donald and party, who are receiving aid for prospecting at Noyeau Gully, near Woods Flat, signed the agreement, &c., on the 14th December, and are now energetically prosecuting the work with every hope of being successful. This party consists of seven men, and previous to signing the agreement they had sunk two shafts to the depth of 164 feet and 150 feet respectively within the prospecting area that had been marked out for them; they had also driven about 135 feet, the colour of gold being found throughout.

At Wallaroo (between Cowra and Canowindra) Crawford and party, who were also to receive aid from the Prospecting Vote, had, at the time of my visit, in December, for the purpose of obtaining their signatures to the agreement, &c., sunk one shaft to the depth of 90 feet, but without striking gold; and in consequence of some delay in getting the papers duly executed they have not prosecuted the work any further up to the present time.

Copper.

The Coombing Mine, which has been handed over by Messrs. Samuel and Lloyd to Mr. Icely, has not been worked for some time past.

The Milburn Creek Mine has continued its operations, and although it is said to have been badly worked, has yielded a considerable quantity of good ores, and is said to look remarkably well at present.

TAMBAROORA AND TURON DISTRICT.

(*Mr. Warden Sharpe, Hill End.*)

I HAVE the honor to submit my Annual Report on the Tambaroora and Turon Mining District.

I regret that I am unable to state that there is any improvement in the prospects of mining since my last report—that for 1877—was written.

During the past year some new discoveries in quartz reefing and alluvial have been made in various parts of the district, but they have, so far, not turned out satisfactorily.

On Hawkins Hill there is a sad decrease in the number of mines at work, and consequently in the number of miners employed; and I regret to say that many of the miners perhaps, and probably from want of means, have, when their employment as wages-men ceased, resorted to other means to obtain a livelihood, the public works, roads, and railways affording permanent employment easily obtained and offering good wages. The recent discoveries at the Barrington have drawn, and I have no doubt will draw away, a considerable portion of the population from here.

The Hill End Division, which is the most important in this district, labours under an immense disadvantage in not having any extent of agricultural land in the vicinity of the mines, which miners could cultivate, and thus unite the two industries of mining and farming.

The Sofala Division owes its partial prosperity to the fact that the miners residing there, especially at Wattle Flat and that neighbourhood, have been enabled to take up small portions of land, which they cultivate, and with the assistance of a few cattle and other stock, which depasture on the commons or reserves, many of them make a comfortable living. They thus have the means to prospect, and occasionally make valuable discoveries, but capital is wanting to enable them to continue the search when the reef ceases to be payable, and unfortunately this capital is seldom forthcoming.

In the present state of things it would almost require a lode of gold to tempt capitalists to invest their money in gold mines. I have already remarked that the population has much decreased in this part of the Tambaroora and Turon Mining District, and it is a puzzle, not easy to solve, how those miners remaining make a living. There are still a considerable number, and considering the few mines that are payable, how they exist is a mystery. I believe Hill End would be almost deserted were it not for the fact that some of the miners, very old residents, and experienced in the character of the reefs they have been working for so many years, know pretty well where they are likely to find a patch. This being found, they work as long as it is payable or holds out good prospects. As soon as it is exhausted, or the stone looks poor, they leave the claim and search for another.

In this way the rich claims at Hawkins Hill were discovered, and in this way, probably, at some future time, perhaps not far distant, finds just as important will be made in this district.

The day will come when this surface mining will cease to be profitable. Then either the gold-field will be deserted or deep sinking resorted to. On Hawkins Hill there are at the present time few of the old mines at work, and those that are, are principally in the hands of the Star of Peace Company, who have in some cases bought out the former owners, in others have leased the land when it was cancelled, and in others, have the mines on tribute.

The Star of Peace mine is, I believe, the deepest on Hawkins Hill, but their prospecting up to the present date has not resulted in any permanent valuable discovery. Two or three times small patches have been found at different depths, but these have not led to anything more valuable. The proprietors seem however to have confidence in their mine, as they have lately erected near their works machinery for crushing, professing themselves dissatisfied with the returns from the machines where their quartz has heretofore been treated; be this as it may, a substantial benefit must accrue to the company in the saving of expense in not having to cart or pack the quartz to a battery at a distance. Hawkins Hill, in the vicinity of the rich claims, may be said to be thoroughly prospected, and all valuable surface stone removed to a certain depth, about 300 or 400 feet, except in one or two instances where there may perhaps be a surface shoot left, because from some reason the miners have not been able to get possession of the ground to take it out. It seems very probable that most of the rich claims, or those known as the rich claims, will fall into the hands of the Star of Peace Company—indeed they hold a very large proportion already. This has given rise to great dissatisfaction among the miners. If the company employ a large amount of labour, I have little doubt but that dissatisfaction will cease. I am of opinion—and I have no doubt that most of the miners here will agree with me—that the Hawkins Hill mines, in the state they are now in, could not be worked to advantage, except with the assistance of more capital than is likely to be obtainable by the working miner in the present depressed state of mining in New South Wales.

Before concluding my remarks about Hawkins Hill, I may mention, as an interesting fact, that Mr. Pittman, the Geological Surveyor, recently sent up by the Government to make a geological survey of this place, has shown me some fossil corals discovered by him in rocks taken from Messrs. Vere and Company's claim on Hawkins Hill. Mr. Pittman states that the overlying rock on Hawkins Hill is metamorphosed conglomerate, and not diorite, as is generally stated. I may here mention that one claim here still preserves its character for producing rich stone. I refer to the new Lady Belmore, at the foot of Hawkins Hill. The specimens are very rich, and the owners may congratulate themselves that they have a valuable mining property.

During the year a reef carrying payable gold was discovered at a place called Washing Gully, which is situate about half a mile west of the township of Hill End. On the reef or vein a good many mining tenements were taken up, but I am sorry to say only one of the present claims is at present payable. The vein is very narrow, and runs close to an old line of reef called the Washing Gully line, which was worked to a considerable depth and distance some years ago.

At Tambaroora there is little or nothing doing in mining. One party of Chinese are on payable stone. They are working a claim on the Red Hill. There are several parties of Europeans engaged in prospecting, but their efforts have not as yet been crowned with success.

At Chambers Creek there is no mining of any consequence being carried on, and the line of reefing country from that place to the foot of Hawkins Hill, a distance of about 6 miles, is totally abandoned.

At Ironbarks mining has not progressed so favourably as was expected at the date when my last report was written. There is little doing in quartz-mining, and no fresh discoveries of reefs have been reported during the past year. In July last the prospects of alluvial mining in this division of the Tambaroora and Turon Mining District were considerably improved by a new discovery near the Mookerawa Creek, at a place called the Bald Hills, distant about 5 miles from the township of Ironbarks. A drift was discovered under the basalt and the prospects in the Prospectors' Claim and that adjoining it were remarkably good. In the former it is stated that prospects were obtained showing from 14 to 21 dwts. to the dish. A number of claims were taken up, and various tunnels driven into the hill. After many weeks hard and expensive work the majority of the tunnels were found to be at too high a level. The miners were disheartened and left the place; in fact, most of the claims were abandoned without even getting on to the wash. Some few, more persevering than their fellow miners, remained, and in the claim known as No. 2 North, the Mining Registrar reports that the holders are at this date driving through 40 feet of wash-dirt, with very good wages prospects. Their success has caused matters to look up, and several abandoned shares are retaken. In the Prospectors' Claim the proprietors have not as yet had a washing up. They have about 100 tons of wash-dirt to treat, but I am unable to ascertain what the probable yield will be. Some time back a few loads of wash-dirt from this claim gave a very handsome return, seven or eight loads yielding 38 ounces of gold. I may here mention that there are in this district very large areas. For instance, on either side of the Turon and Macquarie Rivers, and extending for many miles on the Mookerawa Creek, to where leads exist under the basalt. In some places cement is found containing gold in payable quantities; in others wash-dirt occurs without cement, which has yielded very satisfactory returns. For example, on the hills known as Finch's and the Horse Bald Hill, on the Macquarie River, I am satisfied that a considerable number of miners working quietly under the basalt in these places have for years past been obtaining very satisfactory returns. The only drawback is, water is very scarce, and the miners have often to wait a long time before they have sufficient to wash up the stuff they have obtained. I am confident that in time to come these hills will supply large quantities of gold; but until the place is more easily accessible, and where gold is less difficult to obtain and save, are exhausted, I presume the basalt hills will not receive much attention from capitalists.

I have had occasion to mention in my former reports that two large crushing plants had been erected at Pulley's Hill, on the Macquarie River, for the purpose of crushing the cement which is there found in large quantities under the basalt. After crushing some of the cement, and trying some of the wash-dirt which lies under the cement, the owners were not satisfied, and allowed their leases to lapse. It is to be regretted that this valuable machinery, which can hardly be removed—one plant especially, which is erected on the river, and which has leading down to it a tramway 500 yards in length—should be allowed to lie idle and be destroyed without a further trial being made to ascertain whether the cement and alluvial are payable or not.

At Sofala the Mining Registrar reports that during the last twelve months mining operations have been greatly retarded in consequence of the scarcity of water during the past year; but I observe that on comparing the returns of the quantity of gold won during 1877 with those of last year there is an increase of over 400 ounces for 1878.

At Spring Creek, near Sofala, the reef belonging to the Spring Creek Gold-mining Company will, it is supposed, prove payable. A crushing plant has been purchased, which has yet to be removed from Tambaroora to Spring Creek. Most of the miners who have worked this reef speak highly of it; and if the present Company obtain payable stone in quantity it will probably be the means of inducing capitalists to work other reefs in this neighbourhood.

At Wattle Flat there are a few claims at work, and the miners complain that various leases, the property of Sydney Companies, and supposed to be very valuable, are allowed to lie idle. I may here remark that the bailiffs of the Wardens' Courts are instructed to report all cases where the labour conditions of mining leases are not complied with; and I believe, as far as this district is concerned, they perform their duties faithfully, but they labour under a great disadvantage in not being able in many cases to identify the leases. The miners complain that the labour is not employed, but they seldom report a lease themselves as having no labour employed; and I have no hesitation in saying that some of those who signed petitions complaining that labour conditions were not fulfilled on gold leases were themselves guilty of the same default. One or two claims at Wattle Flat have lately been yielding very rich stone. Muir and Vassella's claim, on Oakey Creek, adjoining the ground belonging to the O. K. Company, has given some handsome returns; 43½ tons yielding 189 ounces 4 pennyweights of gold, and 17 tons of rubble, 38 ounces 12 pennyweights and 8 grains. The owners are at the present time engaged in raising quartz which shows gold freely. No 1 North, which belongs to Williamson Brothers, has also produced some rich stone; 12 tons of quartz gave 67 ounces and 10 pennyweights of gold. Another crushing from the same claim of 29 tons of quartz and 12 of rubble yielded 193 ounces 3 pennyweights and 10 grains of gold.

At the Back Creek, Crudine, a new vein has been discovered by Elkin and party, who are at present engaged in raising what they consider payable stone. Besides the prospecting claim two leases have been taken up on this vein.

At the Box Ridge and Quartz Ridge there are very few miners at work. Most of the reefs in these neighbourhoods have been worked to the water level, and further prospecting requires more capital than the working miner can command.

During the past year I have been requested to name any gold-field likely to afford profitable employment to a number of miners, provided water for mining purposes could be brought on the field at sufficient elevation; and in the event of my knowing any such field, I was requested to state its distance from a river or other source of water supply, and the extent, nature, and position with respect to supply of water, of the deposit to be worked; and also to give any information indicating the practicability or expediency of bringing water for mining purposes to any particular locality. After making careful inquiry, I was unable to name any locality in this district which would be likely to afford profitable employment to a number of miners, even though water for mining purposes could be brought on the ground at sufficient elevation. There are limited areas in the vicinity of Hill End and Tambaroora, and in other places, that would pay private companies if water could be got on without great expense; but there is no source of water supply, except what is caught in dams erected in the gullies leading down off the range; and the same may be said of the cement hills I have already mentioned. If water could be got in quantity sufficient for hydraulic sluicing on to these cement hills, it seems probable that large returns would be obtained. I may state that a private Company are, or were, engaged in bringing water for hydraulic sluicing from the Upper Turon to Circus Point, a distance of some 15 or 20 miles. They purpose sluicing the various auriferous points occurring on the line of race. Much doubt among the diggers was expressed whether the water would ever reach even near Sofala, which is a considerable distance from the terminating point; but this has been accomplished. At the date of my visit a strong stream was running in the race, a short distance above the township. The bringing a race, such as the one I have mentioned, for a long distance down a river, where mining tenements have been long in existence, is attended with great trouble and expense; so many old water-rights and water-races have to be purchased, and doubtful rights to be investigated, that the undertaking, unless in the hands of those experienced in mining matters, would seem hopeless.

In conclusion, I may state that in spite of the deplorable depression that exists in mining in this district at the present time, and especially at Hill End, where so much capital has been expended fruitlessly, from want of management and other causes (and I fear we will reach a much lower state even than that we are in at present), the time will come, I am confident, when many payable mines will be found on Hawkins Hill and elsewhere in this district, and the place will again flourish as it did in the days of the rush.

As this is probably the last report I shall have the honor of writing for this district, which has been for four years under my charge, I take this opportunity of expressing my thanks and gratitude to the Under Secretary for Mines and other officers of the Department for the unvarying courtesy, consideration, and kindness I have received at their hands since my appointment as Warden in charge of the Tambaroora and Turon Mining District.

The annexed schedule shows, as nearly as can be ascertained, the quantities of gold won in this district during the year 1878.

RETURN showing the quantity won in the Tambaroora and Turon Mining District during the year 1878.

Division.	Quarter ending.		ozs.	dwts.	grs.
Hill End	31 Mar., 1878	Quartz and Alluvial	3,998	4	17
	30 June., 1878	„	2,591	2	20
	30 Sept., 1878	„	2,711	17	20
	31 Dec., 1878	„	2,960	14	23
		Total	12,262	0	8
Sofala	31 Mar., 1878	Quartz and Alluvial	1,314	5	6
	30 June, 1878	„	852	17	6
	30 Sept., 1878	„	1,362	4	21
	31 Dec., 1878	„	1,148	12	11
		Sent by other means than Escort	1,072	10	22
		Sent by Escort on the 3rd January, 1879, but won in 1878.	276	3	10
		Total	6,026	14	4
Ironbarks	31 Mar., 1878	Quartz and Alluvial	458	0	0
	30 June, 1878	„	671	0	0
	30 Sept., 1878	„	587	0	0
	31 Dec., 1878	„	321	0	0
		Sent by other means than Escort	600	0	0
		By Escort of the 13th January, 1879, but won in 1878.	49	0	0
		Total	2,686	0	0
		Summary :—			
		Hill End	12,262	0	8
		Sofala	6,026	14	4
		Ironbarks	2,686	0	0
		Grand Total	20,974	14	12

Value, at £3 17s. 6d. per oz., £81,277 1s. 2d. During the past year no separate return has been kept of alluvial and quartz gold, I am therefore obliged to give the total.

MUDGEE DISTRICT.

(*Mr. Warden Browne, P.M., Gulgong.*)

WHEN furnishing my last annual report, I was compelled to allude to the abnormal want of moisture which had characterized the season of 1877, with reference to its unfavourable effect upon nearly all branches of mining. The early part of the present year, or rather of the one which is the subject of this report, promised only a too copious supply of water; but although amply sufficient rain has fallen for pastoral purposes, the watercourses upon which the miners rely for their more important sluicing operations are still low. Indeed, in those localities where large areas of ground must be treated at small cost, by means of a steady supply of race-water, the smaller streams are, for the time of year, unprecedentedly shallow.

From this and for other reasons (among which may be mentioned a considerable exodus of skilled miners to the Barrington and other diggings) it has occurred that the general yield of the Mudgee Gold-mining District has conspicuously fallen off, although the total quantity of gold won from the different divisions is not discouragingly low when compared with that from other auriferous localities. The total amount forwarded by escort during the year of 1878 was, in all, 15,385 ozs. 6 dwts. 4 grs., of which rather more than half was forwarded from Mudgee, Hargraves, and Wellington.

It has always been the opinion of the most experienced miners on this and other gold-fields that the lower portions of the best and most celebrated leads have never been adequately tested. In the vicinity of Gulgong proper the great depth of basalt and the invariable presence of water have tended to shut out such enterprise from all but the capitalist. So much money has been hopelessly sunk in unprofitable and indefensible enterprise that no one can be astonished at the unwillingness of monied men to come forward even in perfectly legitimate and promising mining ventures. Such, however, the fact remains, and thousands of acres well known to be auriferous are condemned to unproductiveness and abandonment on account of the prejudices which have arisen—not wholly without foundation—against anything in the nature of speculative mining.

It can be easily proved, however, that the auriferous drift is to be found at a certain depth in several well-known localities. With powerful machinery equal to keeping the drift-water down and raising the wash-dirt with economy, it can scarcely be doubted that rich and permanent results might yet be relied on in the vicinity of Gulgong and Home Rule.

The vote of £5,000 for aid to prospecting enterprises passed last Session, was, although small in amount relatively to the vast industry which it essayed to develope, distinctly a movement in the right direction. The Prospecting Board has the requisite scientific, practical, and local experience which qualifies it to test exhaustively any project which may come before it. Subsidising mining parties to the extent only of stimulating genuine prospecting labour, and repressing mere desultory occupation, it may confidently be asserted that seldom has the money of the State been expended more effectively and economically.

Several moderate grants in aid have been recommended by the Board for enterprises in the neighbourhood of Gulgong and Home Rule, none of which are unlikely to produce gratifying results.

On a deep and wet lead, named the David Buchanan, at Home Rule, much time and money have been spent in the earlier days of the gold-field. The former shareholders did all that men could do to keep down the incessant flow of water with the rude mechanical appliances then chiefly in use. After a desperate conflict of weeks, at a depth of 170 feet, it was found that work and pumping could not be simultaneously carried on. The present party of shareholders have the benefit of powerful steam machinery, with winding and pumping gear complete. They are men of skill and experience in almost every phase of alluvial mining. With the aid of the promised subsidy, and the mechanical power now upon the ground, a full and complete trial, whether eventuating in success or otherwise, may with certainty be predicted,

The lower portion of the once famous Black Lead is also about to be subjected to the same exhaustive treatment, when the question of the contraction or expansion of the bed of that most ancient of streams, on the borders of which are still found the fossil fruits of long extinct orders of edible seed-bearers, will we trust be definitely set at rest.

In another portion of Gulgong proper, as well as near the once rich alluvial workings of Budgee Budgee, shafts are about to be sunk to prove the exceptionally deep ground—not less than 200 feet—known to exist in both localities.

When it is considered that only *one* discovery of importance in the lower alluvial deposits would suffice to place on the ground and support a large mining population, adding at the same time thousands upon thousands of pounds to the public revenue, and benefiting all classes of producers and distributers, it will be seen upon what a sound economical basis all aid to prospectors stands. Although discoveries of magnitude have been scarce in the district during the past season, many minor deposits have been traced which go to prove the existence of the precious metal in the locality in nearly every position. At Surface Hill, near the town of Gulgong, at a depth of only a few feet, Messrs. Campbell & Parker unearthed in less than a week coarse gold to the value of several hundred pounds. At Mullamuddy, on the Appletree Flat Gold-field, on the bank of the Cudgegong River, a nugget weighing nearly 20 ozs. was found during the winter. Another of these occasional rewards for patient toil was found among the thrice-worked alluvial of Hargraves. At the same place, on the line of the Eureka Reef, Messrs. Bond & Coriolis found a quartz vein in which the gold formed the larger half of the mineral extracted. Latterly, on the upper part of the Black Lead, several claims have come upon good payable gold upon a high bar rising not less than 30 feet from the old level of the gutter. In several of these discoveries all mining experience has been at fault, leading to the deduction that around Gulgong it is impossible to predicate the absence of gold from any given locality. At Home Rule, the Co-operative claim, known as the Red, White, and Blue, is still working, it is understood, with steady paying results. An extended claim, of the largest area allowed by the Regulations, has been taken up by a large body of shareholders on the abandoned portion of the Red Lead, where formerly great obstruction existed from water. It is understood that they have received sufficient inducement to purchase and erect powerful steam machinery and pumping gear. In the event of their area being proved to be permanently payable, much of the lead will be re-occupied, with a view to the same mode of working.

A portion of the lower part of the celebrated Home Rule Lead has been occupied under lease by Messrs. Charlton, Headley, and a strong party. The gold several years since made a very abrupt cessation at No. 8, for which there was apparently no sufficiently clear geological reason. It is not improbable that the present occupants may solve the riddle, to their own benefit and that of the neighbourhood.

In the neighbourhood of Lincoln, near Wellington, I trusted to have been enabled to report that the smelting works of the Eskdale Company, upon the lease of the Belara Copper Lode, were in full and constant work. Such is not the case, however, although a large number of bricks have been burned, and now lie ready for the erection of the furnaces.

The Kaiser Mine, where copper lodes and reef gold exist in juxtaposition, and where one of the most complete crushing plants in the Colony has been erected, at great cost, is still inactive; but no doubt steps will be taken to test the value of the copper lode as well as of the large quantity of tailings before very long.

The Mitchell's Creek Reef, under the superintendence of Captain Richards, has just been engaged in raising several hundred tons of stone to grass from a deeper level than has yet been touched. The tributors will, I am informed, commence crushing at the machine belonging to the reef without much further delay. This is one of the best paying and best managed reefs in New South Wales, and apparently is as permanent as profitable.

In the neighbourhood of the Pipeclay Creek, about 8 miles east of Mudgee, where formerly very rich alluvial deposits existed, a quasi revival has taken place. Payable gold was reported to me as having been discovered on the conditionally purchased land of Mr. D. M'Phee and of Mr. Silas Shute. In accordance with the provisions of the 14th clause of the Land Act, permission was granted by the Minister for Lands to certain miners to dig and mine for gold thereon. Many shafts were sunk, and important finds occasionally rumoured, but eventually it appeared as though the auriferous tidings had been magnified, for the miners gradually deserted their shafts, and apparently despaired of any reward for their labours. In the event of really payable gold being found, the Government has the power to resume the land, compensating the holder of course for his land and improvements.

In the case quoted no such necessity arose, but no doubt exists in my mind of the locality being highly auriferous, though patchy. At any time a discovery of importance might arise in the neighbourhood and restore the mining population, once so thick at Newcastle Gully and elsewhere.

In the neighbourhoods of Grattai, Avisford, Oakey Creek, and Maitland Bar there are still small parties of miners, who mostly dig near to or in the beds of the streams. If not credited with large finds of gold, they do not fail apparently in making a livelihood.

The gold here is found in shallow and patchy drifts, chiefly in the crevices of the slate rocks. It is often coarse, and nuggets are not seldom met with. Unless large areas could be sluiced, for which of late years there does not appear to be sufficient water procurable, it is not likely that these once thriving localities will ever carry a large population again.

From Maitland nearly all the Europeans have lately migrated—the Chinamen alone remaining. A very large number of them comparatively elect to remain gold-hunting beside these mountain streams, nearly 250 out of the total of holders of miners' rights and business licenses in the Hargraves District being of their nation.

Hargraves.—Holders of Miners' Rights and Business Licenses, 412.

Along the hills which skirt Long Creek and the other tributaries of the Meroo may be seen the traces of enormous labour bestowed upon reef claims, then promising, doubtless, but now long abandoned, well-nigh forgotten. In many of these shafts doubtless money was sunk in the search for gold, which had no existence, save in report and prospectus. But on the other hand, it cannot be doubted that really good investments were often deserted before they were properly tested, from blind panic or unreasoning timidity. Their day may yet come, and if but one reef can demonstrate its gold-bearing stone, doubtless much of the silent country of crumbling whims and caving tunnels will echo once more to pick and drill, and the "shots" which used to make a line of reef in full work resemble a park of artillery at irregular practice.

That enterprise is not wholly dead is evidenced by the fact of the shareholders in the Crystal Palace Reef, the last crushing of which went over an ounce, having taken a second contract for their tunnel, making in all more than a hundred yards. By this mode of working they hope to strike the reef, and so be enabled to bring out their quartz more economically than by haulage up a shaft.

The Eureka Reef at Hargraves has made a sign, but of course it may be transient. A quantity of specimens of great value were taken a few months since out of the claim of Messrs. Bond and Coriolis, who are still, however, sinking for the main reef.

In the neighbourhood of the Apple-tree Flat Gold-field, and generally upon the flats which border the Cudgegong, more or less gold has been procured during the past year. Several claims are understood to have paid fairly upon Mr. Pauling's purchased land, and also upon the Crown land adjacent. Between the range and the river, on the northern side, the land is all more or less auriferous, and may possibly yet pay for sluicing in large areas, if we receive again the superabundant supplies of water which former seasons provided.

A rather promising discovery at Campbell's Creek, reported on by me during the earlier part of last year, has apparently retrograded. What gold was procured was coarse and waterworn, and occurred at shallow depths, with considerable uniformity, within a few feet of the course of the creek. Within the last few weeks good specimens have been obtained, and, as it is situated in a locality above the general line of prospecting, more satisfactory results may yet be reached. Gold is found more or less distributed near the watercourses in all the flats and gullies between it and the Pyramul.

The Spicer's Creek workings, lying between Gulgong and Wellington, employed at one time a considerable mining population. Many of the alluvial claims were sufficiently rich, giving more than an ounce to the dish. It is very possible that much of the area was never fully tested, as before its legitimate close as a gold-field the more promising rush called "Two-mile Flat" was announced, which caused nearly the whole of the population to migrate *en masse*, few of whom, if any, returned.

During the last year Messrs. W. Craigen and party, who are experienced miners, have been prospecting with partial success in this locality, having sunk nearly a thousand feet in all, and driven most of the shafts. In some instances sufficient gold was extracted to pay ordinary wages, but eventually the party had to discontinue their operations.

This is the only one among the numerous auriferous localities in the Mudgee district of which it is impossible to say whether they will not ultimately become the seats of extensive mining operations. Far less promising spots have revived and recovered a golden reputation.

In concluding this report, I may state my opinion, confirmed by added experience, that the auriferous deposits of the Mudgee Gold-mining District are still very far from being worked out, or indeed exhaustively prospected. Many rich veins and leads will hereafter be discovered. Much alluvial working has been done in a hurried and incomplete manner, while with regard to the lower and more difficult portions of many of the best known leads, they can hardly be said to have been attempted.

With respect to the quartz reefs of the district, more especially those in the vicinity of Gulgong, trial sinking, possibly with the diamond drill, will be necessary at greater depth than has yet been hazarded before the true reefs are likely to be reached. Then those astonishing quartz ledges may be invaded, from which, in disintegration, so many tons of gold during this decade must be held to have proceeded.

Schedule appended to Annual Report.

Gold forwarded by Escort in 1878:—

	ozs.	dwts.	grs.
Gulgong	6,488	9	23
Mudgee	4,331	19	17
Wellington	3,098	4	4
Hargraves	1,466	12	8
Total	15,385	6	4

	1878. No. of Miners' Rights.	1878. No. of Business Licenses.
Gulgong	455	53
Hargraves	374	39
Wellington	30	2
Mudgee	159	5
Total	1,018	99

LACHLAN DISTRICT.

(*Mr. Warden Dalton, P.M., Forbes.*)

In submitting my annual report as to the progress made in the development of the mineral wealth of the Lachlan Mining District during the year 1878, for the information of the Honorable the Minister for Mines, I have to state that generally throughout the district gold-mining, as during the preceding year, has been restricted to portions of the old leads and workings.

Although prospecting has been carried on in several portions of the district by parties of miners, aided by local associations, during the early part of the year, and also by other parties working on their own resources, no discovery has been made of any new lead or auriferous deposit that could be worked with remunerative results. In many instances, at a considerable depth, gold has been found on the bed-rock by the prospectors referred to, but nowhere in payable quantities.

On the plains of the Lachlan District, often a dead level for many miles, and entirely devoid of watercourses, the alluvial surface presents but few indications of the subjacent formations or the course of the ancient channels; hence the difficulty in prospecting new ground or picking up lost leads. To illustrate this, I invite attention to the fact that eight leads, each from 1 to 3 miles in length, have been traced on the north bank of the Goobang Creek, and worked to the margin of that stream, where the auriferous drift was found at a depth of 70 feet below the bottom of the present channel. All attempts to trace the continuation of these leads to the opposite bank have hitherto proved unavailing. About a mile and a half southerly from the lowest workings on the leads indicated were four small block claims, situated on the Scrubby Plain, and evidently forming part of a lead. From a depth of 54 feet these claims yielded alluvial gold of the aggregate value of about £50,000. All efforts made to discover a connection between these rich deposits and the leads on the north bank of the Goobang Creek have up to this date proved failures. Many miners who have worked on every lead in the locality are convinced that such a connection does exist, and during the last four years the search has been prosecuted from time to time with unabated confidence in ultimate success.

Prospecting has been carried on over the country for 50 miles due north of Parkes, and while gold has been obtained at various depths in the vicinity of reefs known to contain a little gold, it was nowhere payable, and only in sufficient quantity to induce further search. The same result was obtained at the depth of 109 feet to the east of the Goobang Creek, and yet the most experienced prospectors still have faith in these several localities.

Billabong Gold-field.

During the year ended on the 31st of December last no new auriferous deposit has been reported on this field. The mining population has been still further reduced, and those who remain have partially reoccupied such portions of the old workings as were said not to have been exhausted, and are thus scattered at long intervals over eighteen of the principal leads. These have been already described in former reports. The most productive during the year have been the South Bushman's Lead, when it was discovered that the main lead had been split by a bank of mullock, and that the outside run had been overlooked by the first occupants, the South Welcome Lead, and the North Bushman's; and on these the majority of the alluvial gold-miners working upon the gold-field have been continually employed.

Amongst the minor leads, Tearaway Gully has attracted attention here. About August last, a nugget weighing 19 ozs. 7 dwts of gold was obtained from an old claim by a miner named P. Burdett, who found it at a depth of 15 feet. About two years since a nugget weighing 39 ozs. was unearthed at a similar depth in the same locality, and several others of less weight at a subsequent date, all indicating that a valuable auriferous quartz reef cannot be far distant.

There are but few places more worthy of the attention of the quartz-miner than the heads of the Welcome Lead, more particularly Tearaway Gully and its vicinity. The hills and ridges on either side of the gully contain several large quartz reefs, associated with dykes of diorite and masses of porphyrite, traversing highly disturbed silurian formations, altered, fissured, and contorted, and abounding in iron, sulphur, and such other minerals as are usually found in gold-bearing formations, or altered rocks investing auriferous veins. On the crest of a long ridge immediately above that part of the gully where the nuggets were found is the Welcome Reef, in a mass of diorite and altered slates and shales. This reef was worked some years since, when the gold won is said to have exceeded 3 ozs. per ton, decreasing in depth as the strata became more settled, until with a change in the walls of the fissure it ceased to be worked with profit at a depth of 80 feet. At the base of both sides of this ridge is an unbroken succession of patches of surfacing and leads, all tributary to the main Welcome Lead, and all indebted for their gold to the disintegration of the gold-bearing dykes and veins by which they are encompassed. It is probable that much of the gold-bearing rock that once crested the hills has been disintegrated and washed into the valleys, but much must still remain in situations favourable for its preservation.

Although the slopes and valleys round Parkes have been worked by the alluvial gold-miner since 1870, the quantity of gold transmitted by escort from the local Banks proves that the yield in proportion to the number of miners actually employed is not below the average of former years.

The number of miners employed in the alluvial mines during the year, exclusive of prospectors in new ground, did not at any period of the year exceed 300. Early in December eighty-seven claims in the aggregate were being worked by about 250 miners; of these 187 were raising wash from their respective claims. These claims were in many instances worked from the old shafts and drives in dry ground.

The quantity of auriferous wash treated by the puddlers was shown by their books—16,860 loads; quantity treated of which no account has been kept, estimated 1,140 loads; total, 18,000 loads.

The average yield of gold was 5 dwts. 2 grs. per load.

In consequence of the breaking up of the drought sufficient water has been available for mining purposes during about eight months of the year.

The discovery of some important lead will be necessary to induce the miners to relinquish their present occupations and return to the gold-field.

Quartz.—The only quartz reef worked during the year was the Bonnie Dundee; from this reef 440 tons of stone was raised by Eckroom and party, from which they extracted 450 ozs. of gold. This reef is in a decomposed argillaceous rock, and underlies the Bushman's Lead, at a depth of 80 feet below the surface. The stone raised by Eckroom and party was from a depth of 140 feet.

Nearly all the reefs on this field are associated with diorite in dykes, where they prove gold-bearing.

An examination of the quantity of gold won on the several leads and fields will prove that while there is a reduction in the number of gold-miners employed on the several leads and patches of surfacing, and a reduction in the aggregate quantity of gold won during the year, there is no reduction in the quantity of gold won by each miner of average capacity and industry.

	ozs.	dwts.	grs.
The quantity of gold transmitted to the Mint, by Escort, from Parkes, 1878	5,027	16	1
The quantity transmitted from Forbes do.	118	16	23
	5,146	13	0
Estimated from Cargo	1,730	0	0
Total	6,876	13	0

Lachlan Gold-fields, Forbes.

Since the date of my last report a company, known as the South Lead Gold-mining Company (Limited), has been formed for the purpose of working 50 acres of old and abandoned ground at the lower end of the South Lead, on the Lachlan River, near Forbes.

This company holds more than half-a-mile on the gutter of the old lead, and in August last commenced mining operations. Within five months these works were prosecuted with so much energy that the main shaft had been puddled and timbered to the depth of 250 feet, being 20 feet in the bottom—a slate formation; the main levels had been extended 100 feet below the wash-dirt; a water lodgment had been sunk in the rock; and the underground works had been opened out in the most approved manner for working such mines. The old works had been drained, and the wash inspected by the manager.

On the surface a winding-engine of 18 horse-power with gear complete is in operation; a smith's shop and all other requisite buildings have been erected; two cast-iron puddling machines are about to be erected 23 feet above the ground, and driven by a second 18 horse-power engine. When this machinery is in every respect complete it will form one of the largest and most perfect alluvial plants in the Colony.

The quantity of water making in the mine is 450 gallons per hour, and this is brought to the surface without difficulty.

Mr. Phillip Davis expects to have all his arrangements complete in two months, when he will commence blocking out wash-dirt.

Should this company pay a reasonable dividend, and their mine prove to be a success, all the old leads round Forbes will be worked under the same system, with much new ground in the basin of the Lachlan River.

The operations on the Bald Hills by Hey and party, and upon the Victoria Lead by Henke and party, have been so fully described by the Mining Registrar that I can add nothing to his report, except that arrangements have been made by a large and efficient party to work the Bald Hills. There has been no other mining near Forbes during the year.

Pinnacle Reefs.—Eighteen miles south of Forbes are the seven Pinnacle Reefs. These have been worked with profit some years since, but decreased in value with depth, and were abandoned in 1866, and have not been worked since.

There is no water within several miles sufficient for mining purposes.

Hall and party prospected the western slopes in search of alluvial gold during the year, but at the depth of 180 feet found no gold in payable quantity. The Wheogo Mountain, 6 miles south of the Pinnacle, contains auriferous reefs unworked, although frequently occupied for that purpose.

Strickland's Reef, between Forbes and Parkes, has been unworked during the year.

Robert Callow, machine-owner, at Forbes, crushed between 800 and 900 tons of surface rubble quartz pebbles; the return was 60 ozs. of gold.

No other reefs near Forbes have been mined upon during the year.

Lake Cudgellico.—Foster's Reef Gold-mining Company (Limited):—The tract held by this company is 13 acres, now under application for lease, the original lease having been cancelled for non-execution by the lessees. The total quantity of quartz treated and raised was 5,675 tons, from which 1,774 ozs. of gold were obtained, of the value of £6,801 3s. 4d.; of this quantity 1,099 tons were operated upon during the half-year ending on the 31st July last. Mining operations were suspended by the company on the 1st of August, 1878. They have again made application for a lease of the same tract, which they continue to occupy. The plant was erected at the cost of £6,391 19s., and includes every modern improvement. The depth of shaft is 185 feet. The width of lode varies between 3 and 6 feet, with a north-east bearing. The hanging-wall is a soft talcose slate, the foot-wall a close-grained sandstone. The water level is at a depth of 45 feet below the surface—that made on the north end of the mine is salt, and at the south end fresh and pure. In that part of the mine where the quartz was most rich in gold there has been much disturbance, and the quartz is fractured. The number of men employed averaged thirty. It is expected that this mine will be re-opened in a short time. There are about 150 adult inhabitants residing in the town, thirty of whom are miners.

Cargo Gold-field.

During 1878 the mining population of this field has somewhat decreased, and there have not been more than five alluvial claims occupied on Gum Flat; of these one has reached a depth of 340 feet. These claims have been worked for several years with the same results, the wash varying but little in its yield of gold, the average being 4 dwts. per load.

The Ironclad Company have resumed work, and, under a change of management, are treating pyrites with much success, and upon this the profitable working of the mine depends. The alluvial mines upon this field may become exhausted, but the Ironclad Range is a vast field for enterprise, and will afford employment to a large number of miners for many years. The working of the mines on the range will require a large capital, which may be obtained if the Ironclad Company can work with profit.

The Mining Registrar has so fully reported with respect to this division that a repetition of the details is unnecessary.

Fencing and tank-sinking in the back country is the dernier resort of the luckless gold-miner. He forms a party, and takes large contracts that extends over years, so that a long drought has an effect upon the gold-fields that does not terminate with the dust storms and whirlwinds.

The marked reduction in the quantity of gold won within this district is attributable to many causes. The number of miners is becoming less every year, a great many finding other employment; and the prospecting for new gold-fields is in no way commensurate with the extent of known auriferous country. It is frequently asserted by many of the residents in our gold-field towns that the old gold-fields have been exhausted, but I hold a different opinion, based upon long experience and a comparison of our progress with that of Victoria and other gold-producing colonies. The Lachlan, Billabong, and Grenfell Gold-fields have only been very partially worked, and I believe that there are on each of those fields numerous leads to be yet developed.

It is not probable that the wet deep leads of Forbes will ever be worked by the individual miner; in fact, the gold-digger of New South Wales is only experienced in his work up to a certain stage of mining, what may be termed shallow rushes in dry ground of limited depth, such as can be worked by manual labour aided by horse-power to the extent of a whip or whim; and wherever the difficulties become too great to be overcome by the aid of such appliances, as a rule, the gold-field has been abandoned, but this is no sufficient reason for saying that it has been worked out.

I feel justified in saying that if adequate machinery was, under competent supervision, employed upon our deep and wet leads a new era in gold-mining would be established. Small parties of miners, possessed of neither capital or machinery, cannot work ground of this nature with profit. In fact, this class of gold-mining should be in the hands of those who have ample means at their disposal; until this is effected there can be no reasonable expectation of seeing the deep and wet portions of our partially worked gold-fields efficiently mined upon. The deep leads of Forbes have been idle for sixteen years, although known to contain gold. When the shallow mines of Ballarat had been followed until they became too deep for manual labour, a great lull in the yield of gold followed, and the mines lay unoccupied; the field, as far as the powers of the ordinary digger enabled him to work with profit, had been exhausted. At length a new set of men came upon the field, provided with both machinery and capital sufficient to enable them to follow the gold to any depth; the mines were re-opened, and at great depths proved to be more productive than ever, and in many instances the profits were immense. It is therefore not unreasonable to expect that such gold-fields as Forbes, the Emu Creek, the Tyagong, and the Billabong should under similar conditions still be able to contribute largely to our yield of gold.

There is, however, as far as the deep leads of Forbes are concerned, a prospect of our being on the eve of a change in the system of working our deep leads. As already stated, a company has been formed under the Limited Liability Act, with a capital of £5,500, with a view of working the continuation of the South Lead. This company have already made good progress with their work; it is expected that washing will soon commence. It is to be hoped that the company will succeed in their enterprise, as it will stimulate the formation of others. They already employ over twenty men, who will soon be increased to 100.

Last winter six men were employed working the Bald Hills Lead; the depth is about 200 feet, and no drift to contend with. The last machine of dirt washed on this claim contained eighteen loads, and yielded 18 ozs. of gold, yet this party had to suspend work, owing to an excess of water, for horse-power. A very small pump would keep this mine dry. The water is making in the slate, and would be a benefit to any company who had machinery; it would be required for puddling. This mine is about to be worked by an efficient party. The obstacle has been hitherto a want of capital—a want that has prevented the working of many valuable gold mines with profit.

There are quartz reefs in this district that have been abandoned for a similar cause. The Britannia quartz reef, situated about a mile south of the town of Forbes, has been abandoned for fourteen years; while it was at work it yielded as high as 10 ozs. of gold per ton, and never less than 1 oz., but, as in all the other mines, the water became too great for manual labour to contend with. The outcrop of this same lode is traceable on the surface for half-a-mile in length, and in several places rich stone has been discovered to the depth of 50 feet, water-level.

It may be said that the Britannia quartzose ridge is the rock that produced much of the gold in the neighbouring leads—Grasset's, Madman's, South Lead, Victoria, Caledonia, North Lead, Thompson's, and some others have been all traced to the same belt of auriferous rock; and no doubt when this outcrop is followed and searched further to the southward it will be found to be auriferous, and will yield its gold to other tributary gutters from its eastern flank.

The outcrop is traceable to the bottom of the Lachlan River; on the southern bank there is a very bold outcrop of the Britannia Reef invested in slate.

The leads of this district, after having been traced some miles, become impoverished and ill-defined, spreading out into a series of crab-holes, or what may be termed "gilgies," and at this juncture they are usually given up; in other places they are persistently followed, and sometimes found to have again re-formed. All the leads that take their rise from the diorite ridge of Forbes trend to the south; when they are followed a few miles further in that direction they may be found to junction with the ancient bed of the river winding from the eastward and pursuing its course westward beneath the plains.

Emu Creek and Tyagong Gold-fields.

Have been for some years in an inactive state as compared with the energy with which both alluvial and quartz mining was carried on between 1866 and 1870. The Consols Company has been wound up, and the machinery removed. A small outcrop of quartz was discovered on the boundary of this mine some time ago that gave profitable employment to about six miners, but this vein has become of no value, and is abandoned. There is no prospect of this reef being worked with energy and efficiency. There are a large number of quartz veins and lodes on both the Emu Creek and the Tyagong. A number of these were celebrated for their richness, and produced a large quantity of gold, but when followed down to the first and second breaks or faults they fell off in yield. Of these the Enterprise is at present the most productive, yielding a large profit to the shareholders. Several other reefs that had been long abandoned were re-occupied by small parties during the year, and generally the quantity of gold won has been remunerative, and, as a whole, quartz-mining has progressed.

There is abundant room for the legitimate miner in this district. The ground must be tried at greater depths, and cross-cuts driven to intersect the almost numberless quartz veins that are known to exist on these gold-fields.

I believe that the leads, if persistently followed to the deeper channels, would be found payable. The alluvial basin of this district is exceptionally well-defined, being surrounded on all sides by belts of granite, diorite, and altered rocks.

Alluvial mining has not been prosecuted with energy; a few miners, not exceeding thirty, have been chiefly employed in fossicking on the old leads at the Seven-mile and other outside parts of the field.

Mining for minerals and metals other than gold has not been carried on during the year within this district.

At the close of year 1877 I stated that there was a growing disposition amongst the quartz-miners of Grenfell to re-occupy the abandoned reefs round that town. Portions of many of these during the year 1878 were taken possession of by small parties of working miners, who have raised stone from the old workings in small parcels, and in many instances it was proved that these mines might still be worked with profit.

There were but two crushing plants upon the gold-field in operation during the year 1878. At the first, under the direction of Mr. J. D. Campbell, 1,040 tons 17 cwt. of quartz were treated; and at the second, under the management of Mr. Duncan Cameron, 771 tons of stone were passed under the stampers, making a total of 1,811 tons. Much of this was trial parcels from old reefs that had been unworked for several years.

The total quantity of gold extracted from the 1,811 tons was 1,092 ozs. 10 dwts. 19 grs. Much of the stone treated was raised from mines that when first worked produced from 2 to 3 ozs. of gold per ton; but the stone gradually decreased in value with the increased depth and with every change in the investing rock traversed by the fissures that now contain the reefs.

The porphyrite, slate, and gold-producing rocks to a considerable depth in the country round Grenfell have been fractured and dislocated, slides have occurred, and nearly every auriferous block of marked value has been found to terminate with a break or fault at either end; frequently a block of slate is found to have intruded across the line of the reef, as at Lawson's Hill. There is no reason why the dislocated or shifted portion of the reef should not be as rich in gold as that in its original position, or why these lost blocks should not be persistently sought for.

I am informed that 18 tons of quartz obtained from a recently discovered reef or block in Lawson's Hill has produced at the rate of 3 ozs. 10 dwts. of gold per ton. The reefs in this locality were amongst the first worked round Grenfell, and is one of those places that abound in faults and evidence of disturbance at a period subsequent to the formation of the gold-bearing reefs and veins of the district.

I transmit herewith a return of the several parcels of quartz crushed and treated at Emu Creek during 1878, with the quantity of gold obtained from each parcel.

As far as can be ascertained, the quantity of gold obtained from the alluvial leads within the Emu Creek Gold-field during 1878 was 138 ozs., but as the Banks at Grenfell have purchased 320 ozs. of gold more than has been accounted for, I am inclined to think that a large part of this excess should be placed to the credit of the alluvial mines at Grenfell. Fossickers usually sell their gold to the storekeepers on the leads, who transfer to their dealers and merchants, who in their turn dispose of the gold in a variety of irregular channels.

The quantity of gold purchased by the banks at Grenfell during 1878 was 1,552 ozs.

The number of miners actually employed at the Emu Creek and the Tyagong Gold-fields did not at any time exceed 150 men in 1878.

That the Emu Creek and Tyagong Gold-fields do not make more rapid progress may be attributed to the poverty of the miner, the great depth of the country to be operated upon, and the little interest taken by the commercial community of the district in mining affairs.

Quantity of Quartz crushed and treated at Grenfell, being the produce of the Emu Creek Gold-field, during the year 1878, on account of the undermentioned parties:—

Williams and Moran—202 tons; yield of gold, 95 ozs. 11 dwts. T. Handshaw—142 tons; yield of gold, 57 ozs. 1 dwt. Cottome and Palmer—24 tons 3 cwt.; yield of gold, 23 ozs. 18 dwts. Niggmann and Evans—60 tons 10 cwt.; yield of gold, 14 ozs. 17 dwts. 6 grs. Fitch and Son—25 tons 7 cwt.; yield of gold, 13 ozs. 16 dwts. 6 grs. D. O'Malley—2 tons 5 cwt.; yield of gold, 1 oz. 10 dwts. James Tippett—9 tons 10 cwt.; yield of gold, 1 oz. 18 dwts.

Homeward Bound Reef.—Schmkel, Clarkson, and party—262 tons 2 cwt.; yield of gold, 106 ozs. 19 dwts. Joseph Tippett and party—16 tons; yield of gold, 6 ozs. 15 dwts.

Lucknow Reef.—T. Pritchard—76 tons 16 cwt.; yield of gold, 26 ozs. 15 dwts. 12 grs.

Homeward Bound Reef.—E. Williams—13 tons 8 cwt.; yield of gold, 4 ozs. 13 dwts. T. Williams—15 tons 4 cwt.; yield of gold, 9 ozs. 2 dwts. T. Easton—3 tons 5 cwt.; yield of gold, 3 ozs. 2 dwts. 12 grs.

Young O'Brien Reef.—H. Fitch and Son—7 tons 3 cwt.; yield of gold, 7 ozs. 3 dwts. J. Bolton and party—17 tons 6 cwt.; yield of gold, 19 ozs. 17 dwts. John O'Connor and party—2 tons; yield of gold, 1 oz. 10 dwts. A. Stiff and Sons—82 tons 10 cwt.; yield of gold, 35 ozs. 17 dwts. 12 grs.

Prussian Reef.—T. O'Malley—15 tons 15 cwt.; yield of gold, 23 ozs. 12 dwts. 12 grs.

Victory Reef.—T. Allsop—16 tons 8 cwt.; yield of gold, 5 ozs. 10 dwts.

Homeward Bound Reef.—H. Maher, T. A.—80 tons; yield of gold, 23 ozs. 15 dwts.

Barmedman Reef.—H. Minter and party, No. 2 North—9 tons; yield of gold, 9 ozs. 5 dwts.

Scalding Flat Reef, Curagabal.—H. Hilder—8 tons; yield of gold, 5 ozs. 4 dwts.

Result Reef.—T. R. Wallace—4 tons; yield of gold; 1 oz. 5 dwts. Nine parcels of alluvial pebbles, 110 tons 19 cwt., collected on the surface; yield of gold, 17 ozs. 13 dwts. 23 grs. All the parcels of quartz, as above described, were crushed and treated at Campbell's Steam Crushing Plant, at the head of Star Lead, near Grenfell.

Welcome Reef No. 2.—A. Dunn and party—108 tons 10 cwt.; yield of gold, 26 ozs. 17 dwts.

Homeward Bound Reef.—Maher and King—15 tons; yield of gold, 5 ozs. 14 dwts.

Homeward Bound Reef.—Mitchell and party—139 tons, 6 cwt.; yield of gold, 18 ozs. 2 dwts.

Lawson's Reef.—John Laurence—5 tons; yield of gold, 7 ozs. 1 dwt.

Lucknow Reef.—J. Pritchard—16 tons; yield of gold, 7 ozs. 14 dwts. J. Stanton—9 tons; yield of gold, 14 dwts.

Lawson's Reef.—R. Hinchcliffe—13 tons 10 cwt.; yield of gold 10 ozs. 14 dwts.

Enterprise Reef.—Hall and Son—49 tons 6 cwt.; yield of gold, 25 ozs. 14 dwts. Pettitt and party—224 tons of quartz; yield of gold, 363 ozs. 16 dwts. 7 grs.

Welcome Reef.—Allen and Paice—70 tons 10 cwt.; yield of gold, 17 ozs. 16 dwts.

Prussian Reef.—J. O'Mealy—5 tons; yield of gold, 3 ozs. 16 dwts.

Welcome Reef.—J. Albert—6 tons; yield of gold, 2 ozs. 6 dwts.

Britannia Reef.—Nelson and party—44 tons; yield of gold, 7 ozs. 13 dwts.

Victory Reef.—John Allsop—42 tons 18 cwt.; yield of gold, 29 ozs. 29 tons rubble surface quartz; yield of gold, 4 ozs. 23 tons wash-dirt crushed; yield of gold, 4 ozs. 4 dwts.

In transmitting my report at this late season, I have to express regret that a delay, caused entirely by maladventure, should have taken place.

RETURN of Gold sent by Escort during the year 1876, from Parkes and Forbes.

Date—1878.	Parkes.			Forbes.		
	Ozs.	dwts.	grs.	Ozs.	dwts.	grs.
January	337	1	15	18	1	20
February	325	15	4	...	...	...
March	566	11	22	...	...	...
April	312	4	15	...	...	...
May	446	2	6	...	...	...
June	380	...	8	...	...	...
June	383	13	2	...	...	...
July	526	...	19	...	...	...
August	403		20	27	2	6
September	271	...	...	...	...	...
October	565	1	...	...	...	...
November	255	10	21	73	12	21
December	255	9	18	...	...	...
	5,027	16	1	118	16	23

LACHLAN DISTRICT.

(*Mr. Warden Robinson, P.M., Young.*)

I HAVE the honor to furnish my report for the year 1878. The Young Division of the Lachlan Gold-mining District has been so thoroughly tested, and its gold-bearing capacity is so widely and correctly known, that it would be writing merely for the sake of filling in space were I to attempt getting up a lengthy report. Those who may require more ample detail, I would refer them to my reports of 1875-6-7. During the past year there have been issued from this office 314 miners' rights and 23 business licenses, which give an increase of 61 rights as compared with the preceding period. Notwithstanding this, the number of actual miners has not been enlarged. The discrepancy is explained by the fact that a *scare* seized upon a number of persons who were and still are holding public lands without the sanction of law; they rushed the office for miner's rights, in the belief that this kind of document would entitle them to take up any number of portions of the public estate. I may mention that none of these persons were in any way identified with gold-mining, except to impede its progress. Although the miners have not grown in number, the production of gold has considerably more than doubled that of the previous season. All told, there are about a hundred European diggers, and say twenty-five Chinese, employed on this gold-field. The quantity of gold raised in 1878, taken in round numbers, amounts to 2,143 ounces, and of the aggregate value of £8,145. This distributed would average £65 per man for the year. I may state that even in this unexceptionably favourable season the water supply has not afforded a working period to the digger of over four months out of twelve. The ground throughout the whole division is easily worked, and with larger extent of water storage, adding better working appliances, the place would sustain the character of being eminently a poor man's diggings. There is no engine employed here on any tenement or claim of any kind. The operations in force are surface sluicing and alluvial sinking—chiefly the former, which gives a cash return of about a shilling to the cubic yard. The work performed in alluvial sinking is no less remunerative. Bottom is usually reached at Wombat on granite at a depth of from 6 to 18 feet. On Lambing Flat the depth is greater, but water supply is more abundant. Paid labour is not largely brought into requisition, as the price offered—two guineas a week—fails in drawing any considerable number of hands from the general market. I cannot realize the hope that any attraction presented on this field of labour will bring here—in mining parlance—"a rush." The few diggers we have are full of discontent. I do not mean to constitute myself murmurer for a body of men who proverbially are so well able to grumble for themselves, but in common fairness I must state that they have much reason to complain. Their burden of grievances is capable of being removed, but no remedy has been applied. Imperfect and obscure as the Land and Mining Acts may be, they, however, afford sufficient force and meaning to give the digger ample protection if the administration of the law were carried out with firmness, consistency, and regularity. This is not done, hence the complaint that the interests and privileges of the miner are at all times, and in all places, encroached upon, interfered with, or subjected to trespass of one kind or other. The law is as plain as need be, "that only one portion of land can be taken up by virtue of a miner's right or business license, and that portion must be of specific quantity." It is quite true that a power is given, so to speak, outside the Act to augment the quantity, but that can only be reasonably exercised when it is shown that some exceptional case is presented for consideration. What is the system here? Why this, that persons take up whole township blocks, ten or twenty 2-acre portions, and they hold them at the expense of other interests, and in defiance of both law and common right. The question naturally arises, how is it the law is not enforced? Simply because there is no machinery provided for setting the law in motion. The digger comes again and again to the Warden with his complaint, "that the lands in and about the town are being monopolized by persons having no connection with mining; that they require these places to mine upon; that they cannot even get a decent spot whereon to reside; that their water catches are ruined." *The Warden will not—he must not—be induced*, under any circumstance, to be a party to instituting prosecutions, and then adjudicate in such cases. This is a power which no public officer should possess, much less should he exercise it. The digger refuses to be a common informer, so the matter rests, and the trespassers remain in possession. I may just state that a prosecutor bringing any case of this kind before a Warden's Court, the law is clear enough, and quite sufficient to reach the offender. I know of no exceptional case that has arisen on this gold-field where any man would be entitled to purchase beyond the quantity prescribed by law.

Assuming this statement and view to be correct, then every one who has had liberty to purchase more than one portion, or beyond the quantity mentioned in the Act, has gained more than he is legally entitled to hold. So likewise those who are in possession (and have not been permitted to purchase) of more than one portion should be warned off, and in default of compliance he should be prosecuted by the Crown. On the other hand, if it be determined that the exceptions, which I have indicated, are to constitute the rule, then no time should be lost in making such decision known, both to the digger and the general public. The time has arrived which renders it absolutely necessary to pursue with vigour one or other of the courses here pointed out. Had the Act been strictly enforced when first it came into operation the mining interests would not have been now contending against difficulties and antagonisms which have become really formidable, if not quite insurmountable, that is, so far as Young is interested. It remains to be seen what the underground tunnel of Tonking and Company will do for this place. When finished it will at least partially drain a large portion of ground known to be auriferous, as well as the old workings, which originally were very remunerative, on "Possum Flat." The police paddock is being prospected; this portion is well known to have been tested long ago—there is no claim to be found there to pay for any extent of labour. The best prospects for developing an extensive gold-field with us lie in the country beginning at Cumbamurrah, bearing south, then west, and extending from there to 10 or 12 miles, still in a westerly direction, beyond Cootamundra. Would it not be well for Mr. Wilkinson to map out the country, so that the auriferous lands in that locality should be taken up under section *fourteen* of the Lands Act? In conclusion, I most respectfully submit that, although the aims of the Mining Act are obvious, the wording of its provisions are indefinite, obscure, and inconclusive. There cannot, I think, be two opinions about the urgent necessity of introducing a new Mining Bill. The measure now in force is capable of being cut down, pruned, and by a careful recompilation a suitable measure ought to be produced. From the ready address with which the most intricate questions are disposed of in the Mining Department, and the reputedly thorough knowledge of mining affairs possessed by the Honorable the Minister for Mines, I cannot think the task of revising both the Mining Act and Board Regulations would be either very arduous or difficult.

SOUTHERN DISTRICT.

(*Mr. Warden De Boos, Braidwood.*)

MY report on the Gold-fields of the Southern Mining District for the year 1877 was so little encouraging that I was thereby tempted to expect a reaction during 1878. So far, however, has this been from being the case that things have, I regret to say, gone from bad to worse, and my report for the last past year must be as gloomy as for that which immediately preceded it.

This, as in the former year, is due to the very small amount of water available for sluicing purposes. The long continued drought and the prevalence of strong westerly winds have so dried up the ground that though there have been one or two heavy rainfalls during the year the greater part of the water has been absorbed by the parched earth; and even where there have been floods the supply has been but of short duration, and in the course of a few days have scarcely left a trace behind them. Most of the smaller running streams flowing down lengthy gullies, and which formerly fed capacious races, have given—even in the winter, which is expected to be the rainy season—barely a trickle of water down them, certainly not sufficient to enable the sluices to work.

As a natural consequence, many of the miners, finding it impossible to obtain a living at ordinary mining operations, have turned their attention to other pursuits, and are working on the roads and railways, in the bush, or at such other occupations as their previous work has fitted them for. These men, however, are so engaged only temporarily, and keep their claims registered for a suspension of labour conditions, with the view of again going to work at them whenever the long-looked-for period of rainy seasons shall again set them going. So generally is this the state of things throughout the whole of the Southern Mining District that it has astonished me to find by the returns that the yield of gold therefrom keeps up so well as it does.

The decrease in the number of miners actually at work will not show itself clearly from the separate returns you will receive from the respective Mining Registrars, as, though absent on the roads, railways, &c., most of the men take out miners' rights, in order to enable them to hold their claims until opportunity shall be afforded for again working them. Amongst other discouraging signs of the present droughty times is the fact that the number of Chinese working on the several gold-fields of the district has gradually dwindled down to a mere handfull. As these hard-working, persevering men are satisfied with a very much smaller yield than would content a European, times must be very hard indeed when even they are driven out.

At Little River and the Shoalhaven, work is completely suspended, except on the immediate river banks, though even here the head-races, which are supplied from the river, run so sluggishly and with so small a body of water that the same amount of earth as is expected under ordinary circumstances cannot be moved. The reefs at the former place still remain unworked, although ample evidence has been given that a mine of wealth lies hidden in the stone. A few brief spasmodic efforts have been made to induce parties to interest themselves in the locality, but no really determined step has been taken towards developing the known riches of the quartz veins.

The work at Major's Creek has been for the greater part confined to the private land of Messrs. Hassall and Roberts, and reefing is the main occupation upon which the miners are engaged. The portion of this gold-field which is still Crown land is nearly all alluvial working, and as the depth of earth to be removed is very great, ranging from 20 to 30 feet, and as the earth is too poor to pay for removal in any other way than by water, it can readily be imagined that nothing short of a flood would be of any service for such a purpose. With no water whatever, there can consequently be no work, except in one or two cases where parties have first rights to water out of Back Creek and other permanent streams. There are, however, several large dams on this field, feeding races to the various claims, by means of which a week or ten days' work may be obtained after a few days of heavy rain. The yield of gold on these occasions shows how rich the field would still prove were only a sufficient supply of water obtainable. After such a fall as I have spoken of there is once more a busy scene for a brief space, and the hardy miners work night and day so long as the water lasts, in order to make every drop available towards wresting the hard-won gold from the reluctant soil.

Bell's Creek continues to support a few miners, the greater part of the gold from the private land being obtained from the quartz reefs, the exception being the large alluvial claim worked by Mr. Quong Tart. This has been rather a heavy undertaking, employing some fifteen men and boys, and three carts and horses. The claim, however, has the advantage of a fine head-race, taken from the head of Sheep Station Creek, with which much of the cutting away of the soil has been done. On the Crown lands lower down the creek a little work is doing, Mr. Tart's tail-race giving a supply of water that would otherwise be wanting.

Two new and large claims have been opened during the past year—one by Mr. C. W. Newman, on Crown Flat, and one by Mr. T. M. Alley, higher up the creek. Johnson and party's claim has been in full work since the final settlement of the dispute between them and the adjoining claimholders, and they have been doing very well, although their tail-race is not yet on the bottom. This, however, is not of so much consequence just at present, for owing to the dry season the underground water is not heavy, whilst surface water is so scarce that water has to be pumped up into the head-race in order to wash up the dirt. Blatchford's party, after working several hundred yards of creek bed, have come upon a belt of poor dirt almost abreast of Dirty Butter Creek. They are now prospecting easterly from the course of the main creek, with the hope of cutting some other run of gold, should any such exist. It has always been a favourite idea with the miners of the valley that there is another run of gold to the east of the present creek bed; and if the matter be looked at fairly, it would almost seem to stand to reason that the creek could hardly have always run through all time in its present bed, and that there must consequently be some other and older beds, which require to be searched for. In favour of this hypothesis there is the fact that the character of the gold obtained from the upper, the centre, and the lower portions of the valley is altogether different. This difference, indeed, is so marked as to be at once recognizable by gold-buyers, thus leading to the inference that they are derived from separate and distinct runs or leads of gold, and that by the expenditure of capital these leads or old creek beds may be struck with as good a result as followed the opening of the main creek. But so much of the land in the valley is alienated that mere individual miners see very little inducement before them to expend money or labour in prospecting, seeing that their outlay would be made without any definite advantage to themselves, whilst the expense would be very great. It is only by a systematic prospect, bringing up a tail-race, and then cutting right across the broad flat at Redbank, that the question can fairly be decided. This would, no doubt, require a large outlay of capital; but could any persons be found spirited enough to enter upon the work? I know enough of the owners of the property to say that such persons would be dealt with in the most liberal spirit. The race connected with Newman's lower claim, already on the bottom and securely boxed, could be made available for this purpose.

Coming now to the Coast District, we have first the Yalwal Reefs, which have given a pretty fair return of gold for the past year, though the amount given is, as I am assured by the Warden's clerk at Nowra, far below the actual yield. He estimates that nearly half as much again might be fairly computed to have been won from the stone, and sent down to Sydney by private hands. I have, however, deemed it better to confine my return to gold that has actually passed through the Banks. Of the locality itself I can say little, as my duties have not as yet called me to visit the spot. The distance from Braidwood is so great, and the place is so out of the track of the other fields I have to visit, that I have been unable to spare time for so long a journey. This, however, is hardly to be regretted, as very good descriptive accounts have been furnished by the officers of the Nowra Division.

I have been given to understand that a good many miners have been working occasionally, as water serves in some of the creeks heading from the Pigeon House; and Mr. Shottin, the Warden's Court Bailiff, has come across several such parties. He has several times reported this to me, but my time is so fully occupied in the duties of the very extensive districts under my charge that up to the present I have found it impossible to make such an inspection of this portion of the district as I would desire. Only a short time back an experienced miner, who has been long working in these parts, applied to me for an extensive lease of river bed at the Brimblamalla Creek, one of the tributaries of the Clyde. I have little doubt but that he has made a payable find there, though as yet no discovery has been reported.

At Moga, and again at the Gulph (Nerrigundah), there has been a falling away of the miners to such an extent that in the first-named locality work may be said to have come to a standstill, whilst in the latter very little is doing. In both localities, however, there are large areas of ground, hurriedly worked during the excitement of the first great rush to these places, and which would now pay handsomely for sluicing, if persons with energy combined with capital were to take the matter up, and bring a good head of water to bear upon the ground.

From the Dromedary the yield of gold gives fair promise for the opening of an alluvial field for the work of some three or four hundred men during wet or drooping seasons. At present the limited supply of water must naturally limit also the number of miners who can obtain profitable work in the alluvial. This kind of work has been limited during the past year to the south-eastern face of the mountain; but Mr. Wilkinson, the Geological Surveyor, from a casual inspection of the country whilst passing through it on other business, expressed a high opinion of the auriferous character of the south-western slopes, and strongly recommended that the gullies leading from them should be prospected. As he will no doubt report to you on this subject, I do not feel myself called upon to enter further upon the matter. I may, however, be permitted to point out that the whole of the long series of spurs from that portion of the great Coast Range, which may be said to culminate at the Big Badji Mountain, together with the various rivers whose several watersheds they divide, have all been proved to be more or less auriferous; those rivers running easterly from the Shoalhaven in the north to the Bega River in the south having been more prolific in gold than those running westerly from the Molonglo in the north to the Eumeralla in the south. The Dromedary is the end of one of the spurs maintaining the elevation of the parent range nearly down to the coast line, and forming the division of the waters of the Tuross on the north and the Brogo on the south. The Nelson Ranges, a few miles north of Bega, where several nuggets are reported to have been recently found, are but a branch from the Great Dromedary spur. There is thus every reason for beliving that this range, with its accompanying gullies and watercourses, will be equally as gold-producing as have been the other ranges coming within the same category. The theory is likely to be practically tested shortly, as a Prospecting Association has been formed in Bega, which, with the money raised amongst its members and that provided by the liberality of Parliament, will give the ground a fair trial.

It is difficult to get at the actual amount of gold raised at Delegate. The miners employed there are nearly all Chinese, who are particularly reticent in the matter of the gold obtained by them; and as the gold-field extends across the boundary of New South Wales into Victoria, there is every reason to believe that owing to there being no gold duty there some considerable amount of gold must find its way into the sister Colony. Indeed, I know that large amounts have gone across the Border—smuggled, in fact—and have been taken into account as Victorian produce. This makes it very difficult to get at the exact amount of gold won in the Border Districts. In fact, as I have pointed out in former reports, the same difficulty exists along the whole coast line, for, though no doubt by very much the larger portion is lodged with and advanced upon by the Banks, still a proportion finds its way to Sydney by private hands, steamer transit offering great facilities for safe conveyance.

Though not in the Southern Mining District, Gundaroo has come so immediately under my notice that I feel I ought not to close this report without offering some remarks upon it. Brookes's Creek has been worked as an alluvial diggings for the last fourteen or fifteen years, but it was not until the closing part of last year that auriferous quartz was found on the ranges overhanging the creek. At the time mentioned these ranges were prospected by the brothers Dawson, who at last, in the course of trenching, hit upon a rich find of rubbly quartz—half stone, half alluvial—within about 3 feet of the surface. They then followed the run of stone downward through a stratum of decomposed slate to a depth of 25 feet without coming upon anything like a permanent reef enclosed within fixed and settled walls. Several veins were met with, now making, now running out, sometimes pitching down vertically, at others lying horizontal, then sloping at different angles; now east, then west. In fact, down to the

Return of Gold purchased by the Banks in the

	Araluen.	Major's Creek.	Little River.	Shoalhaven River.	Bell's Creek.	Jembaicum-bene.
1878.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.
January	....	239 14 9	210 11 19	29 1 12	....	0 10 0
February	....	155 11 12	127 15 19	18 0 4	....	....
March	....	328 4 12	140 0 15	34 14 23	44 14 16	13 13 23
April	0 4 4	535 1 18	348 16 11	36 5 21	147 16 8	10 18 17
May	....	159 17 6	89 14 12	35 8 17	....	9 3 12
June	75 14 0	247 3 2	120 15 4	161 3 18	....	....
July	....	199 2 12	152 6 5	15 18 11	....	1 19 9
August	....	188 4 7	113 14 22	2 2 14	....	....
September	....	221 0 8	128 4 20	230 2 12	50 11 17	11 15 6
October	....	184 16 14	171 11 10	37 6 5	87 0 0	4 18 16
November	....	146 9 17	126 12 4	32 15 20	8 14 0	....
December	....	207 9 13	207 15 22	103 13 11	....	9 6 20
Lump sums for the year	5,048 0 0	....	....	50 0 0	228 0 0	100 0 0
Total	5,123 18 4	2,812 15 10	1,943 19 19	781 9 0	566 16 17	162 6 7

N.B.—The Bank does not buy

Braidwood, February, 1879.

depth to which they have already gone nothing but a broken and unsettled country has been encountered, the quartz veins having gone through the same process of decomposition as the slate which once enclosed them, though not, of course, to the same extent. In the absence of a clearly defined reef between settled walls, capitalists have not been disposed to go to the cost or setting up a crushing machine on the ground; and, wanting a crushing plant, there is no encouragement for miners to prosecute the discovery made—first, because the length of haulage to the nearest battery over-weights the stone, rich as it is, with expenses; and next, because the veins have hitherto been so uncertain, both as regards continuance and size—the width ranging from 1 to 6 inches—that a considerable time is required to bring anything like a decent quantity to grass. At the same time the work is not hard, and no shooting is required. The last crushing of about 10 tons averaged very nearly 3 ozs. to the ton.

Appended is the return of gold actually purchased by the Banks in the Southern Mining District during the year 1878, but, as I have explained already, this does not absolutely represent the whole amount raised.

outhern Mining District during the year 1878.

Moruya.	Queanbeyan.	Dromedary.	Bombala.	Nerrigundah.	Nowra.	Miscellaneous.	Total.
oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.
....	....	....	39 10 4	....	....	340 15 12	860 8 8
....	16 16 12	....	6 4 17	....	....	....	819 8 16
....	....	....	24 2 1	....	....	....	591 10 18
....	....	....	19 17 19	....	....	124 7 7	1,223 8 9
....	10 12 12	1 8 12	46 4 20	....	....	....	352 9 5
....	32 11 10	....	8 4 20	....	....	....	645 12 6
....	....	....	22 4 23	....	....	....	391 6 12
....	....	....	21 4 5	....	....	....	825 6 0
2 1 4	....	....	17 18 2	....	....	....	661 14 21
1 7 16	10 6 4	....	31 15 10	....	....	....	519 2 8
....	54 1 18	....	24 11 19	....	....	....	393 5 6
1 10 14	11 3 0	....	18 2 0	....	....	....	559 1 8
131 5 9	....	630 12 16	195 1 14	30 9 18	763 9 3	....	7,176 18 7
136 4 19	135 11 8	632 1 4	475 1 20	30 9 18	763 9 3	465 2 19	14,019 6 23

owdroy and Pollock's gold.

CHAS. DE BOOS,
Warden.

TUMUT AND ADELONG DISTRICT.

(*Mr. Warden Vyner, P.M., Tumut.*)

I HAVE still to report great dulness in mining matters in that portion of the Tumut and Adelong Mining District under my charge. The small demand for miners' rights as compared with previous years tells a tale of decreasing population, and the escort returns show that the gold won is getting small by degrees and alarmingly less. At Adelong I have never seen reefing prospects worse and the chance of improvement less hopeful, and I fear the same thing may be said of both quartz and alluvial mining throughout this district.

Some people seem to think a large supply of capital and water would improve prospects, but I am of opinion that there must first be a fresh discovery of auriferous ground, for the old ground is beyond doubt nearly exhausted. In copper-mining there is still considerable activity at the Snowball Mine, with a fair prospect of ultimate success when the railway from Cootamundra to Gundagai is completed.

ALBURY DIVISION.

(*Mr. Warden Brownrigg, P.M., Albury.*)

IN forwarding my report of the mining operations in this division of the district for the year 1878, it may be stated in brief that the occupation of mining has all but died out here. The only claim operated upon at the Black Range Gold-field is that held by the Black Range Gold-mining Company, from which about 600 tons were raised, yielding in value £2,250. The number of men employed has not exceeded on an average twelve.

With reference to the gold-fields at Yarrara and Four-mile Creek—at the former there was raised from the Perseverance Reef 207 tons of stone, which only yielded 16 ozs. 6 dwts., and from the Just in Time Reef, 132 tons, yielding 36 ozs. 16 dwts. The company holding these claims are still hopeful as to the prospects of the Just in Time, and have continued operations under the expectation of receiving out of the Prospecting Vote the amount recommended by the Board.

The Mountaineer Reef, at the Four-mile Creek, has been kept at work. The quantity of stone raised, 351 tons, which gave a result of 154 ozs. 16 dwts. 21 grs. The company holding this claim also rely upon receiving the amount recommended by the Board out of the Prospecting Vote.

With regard to the operations of the Jingellic Tin-mining Company, I am unable to afford any information, as my request to the superintending manager of the company's works for any particulars he could favour me with has remained unnoticed.

PEEL AND URALLA DISTRICT.

(*Mr. Warden Buchanan, P.M.*)

I HAVE the honor to submit my annual report on mining matters in connection with this division of the mining district under my charge during the year 1878, and in so doing I regret I have nothing new or important to communicate.

2. The population, yield of gold, &c., remain pretty much the same as when last I had the honor of addressing you on this subject; in fact, the mining industry of this portion of the Northern District had, previous to the recent breaking up of the late long protracted drought, been nearly at a standstill. I submit appendices (4) giving detailed information of particular fields or claims.

3. The Long Tunnel Company's undertaking, at the Rocky River, is a gigantic task, and up to the present time the work has been carried out in a most faithful manner. The Secretary's (Mr. Roman) report does away with the necessity of my enlarging on this enterprise. The number of miners' rights, &c., issued at Uralla, was—Miners' rights, twelve; mineral and business licenses, none.

4. As regards the Bullion Company, who are in receipt of aid from the Government, they are down over 100 feet in a large "double shaft." The prospects are most encouraging, and the company very sanguine of success.

5. The state of the mining interests at Glen Morrison and Tia is amply set forth by the Mining Registrar (Mr. M. S. Love), and requires no comment at my hands. The number of miners' rights, &c., issued, was—Miners' rights, thirty-four; mineral licenses, none; business licenses, one.

6. Oban, Cameron's Creek, Puddledock, and Boro Creek stand very much in the same category as the other fields, and from the cause already stated (absence of rain) there has been very little doing at any of these localities. The Mining Registrar, Armidale, issued during the year—Miners' rights, seventy-six; business licenses, one; mineral licenses, two.

7. There are in that portion of my district to which I am now directing attention no tin-fields to report on—as has been my duty hitherto—that is, if I except Oban, which at present is not being worked.

8. I am sensible my report is not a "cheery one," and I regret it; but I do not, I am constrained to state, see much prospect of any immediate improvement in mining matters in the district with which I am more immediately connected.

(*Appendix No.* 1.)

James Buchanan, Esq., Warden, Gold-fields North,—

Sir, Uralla, 20 January, 1879.

In response to circular letter of 23rd ultimo, I have great pleasure in giving particulars of workings during past year at the Long Tunnel Company's mine, Rocky River.

When I last had the honor of furnishing you a report I stated the workings were then in very hard granite, but that hopes were entertained that this would soon be worked through; however, although from that time to the present date the work has been continuously carried on, the bar has not been pierced.

The tunnel is now driven in a distance of about 1,100 feet, thoroughly secured with timber where necessary, well ventilated and drained, and in every respect in good working condition, so that once through the hard granite it would take the company but a month or two to open out the mine and test its value as a gold-producing property.

In addition to our other works, has been excavated and constructed the base of an extensive dam, which we have in readiness to receive the under water of the Sydney Flat as soon as it is found convenient to "tap" it.

At the present period the works are carried on under the skilful and able direction of Mr. Andrew Martin, late one of the most experienced Victorian mine managers of the day, who I am certain is anxiously looking forward to the time when full scope will be given him for the employment of his talent in opening out and working the mine.

During the past year the works were visited and inspected by the Under Secretary for Mines, Mr. Harrie Wood, and the Government Geological Surveyor Mr. Wilkinson, and those gentlemen expressed themselves highly pleased with their extent and substantiality, and were also favourably impressed with the value of the mine.

I have nothing to add, beyond the fact that as the company has not been working upon gold, simply carrying in the adit to the mine, of course the return is nil as "gold won."

Mining generally has been dull, and the returns of gold small, but this can be accounted for by reason that the yield of the principal part of the present gold-producing claims upon this gold-field is dependent entirely upon storm water, of which but small quantities have been available in 1878.

I have, &c.,
Henry Roman,
Local Director, Long Tunnel G.M.C. (Limited).

PEEL AND URALLA DISTRICT.

(*Mr. Warden Irving, P.M., Tamworth.*)

THE history of the mining prosecuted during the year 1878, unfortunately, in the district under my charge does not afford materials for a very interesting report.

The mining in my district is for the most part carried on in the Nundle Gold-field, which includes the workings at Bowling Alley Point and Hanging Rock. "Minerals other than gold" are not being mined for in my district. The antimony lode, for which some persons wished to take out leases some time back, seems now to be abandoned. I believe the vein of antimony ore was not anywhere met with of sufficient dimensions to make the adventure a promising one.

My district has not been favoured with any discoveries of fresh reefs or alluvial deposits during 1878.

The mining enterprises in existence have been steadily pressed forward by those engaged in them, and in many cases a great expenditure of time and money has taken place, the fruits of which are not yet being realized.

It is much to be desired that the tunnelling intended to strike the deep-sinking alluvial deposit known as the "Cement," at Mount Misery and other places, now being energetically carried on by several parties of miners (who have driven tunnels varying in length from 350 to 700 feet), may soon produce "payable" results, as, besides rewarding the perseverance of the present miners, this cement, being thought to be a drift bed of considerable extent and thickness, if proved payable, must attract a considerable number of miners. The same may be said of the operations going on at the Black Snake Reef, the Brown Snake Reef, and the old Foley's Folly Reef, all near Hanging Rock—tunnels being driven there at great outlay in the endeavour to reach the vein at a lower level.

Some of the numerous reefs on this gold-field which were so eagerly taken up on lease in 1872, and as hastily abandoned, are, I consider, likely to pay if again worked. One of those abandoned leases, since taken up as an extended quartz claim, I notice in Mr. Mining Registrar Kermode's report, has lately produced 30 tons of stone, yielding 60 ounces of retorted gold.

The mining on the Peel River Company's estate, near Bowling Alley Point, continues to be vigorously carried on, and is reported to remunerate the owners handsomely, but the rate of production is not made known. Doubtless the chief reef, the Marquis of Lorne, will yet be hit upon in the Crown lands, and prove as valuable.

Some prospecting for quartz has been going on in the back country (between the northern boundary of the Tamworth land district and the Peel River), on the Swamp Oak and Mullah Creeks; but I can hear nothing to be relied upon as to the result. The number of miners has increased during the past year. I consider the quantity of gold obtained during 1878 is greater than the quantity reported. The quantity reported as the production of the mining on the Crown lands is about 2,600 ounces for 1878. The number of miners' rights issued during the same year is 207. According to this return of gold obtained, the average earnings of each miner during the year are a trifle less than £46. Some of the miners are engaged, however, in undertakings as yet unproductive, and this of course would give a larger average earning to the rest. I trust the year 1879 may witness the development with encouraging results of the cement leads and the reefs at Hanging Rock.

The miners at the Nundle Gold-field have had a long period of ill fortune and dry seasons to go through. I trust I may have a better report to make for 1879, should it fall to my lot to have that duty to perform.

PEEL AND URALLA DISTRICT.

(*Mr. Warden Brougham, P.M., Bingera.*)

IN making this my third annual report, I may in the commencement state there has been a marked improvement in the yield of gold in that portion of the Peel and Uralla Mining District under my charge; and I have been informed that in the early portion of 1879 a new field will be made public, from which they expect good payable gold.

At Bobby Whitlow several nuggets have been found, and there have been one or two rushes in consequence, which have eventuated in nothing. From what I have seen of the ground in that locality—in fact, in all the diggings about Bingera—the gold seems to be patchy, but I am still under the impression that some large finds will be reported.

The Prince of Wales Copper Mine is now sending ore to be smelted; they have forwarded some 20 tons, and are only waiting for drays to send more. This will fully test the quality of the ore, and I hope that ere long I shall be in a position to report smelting furnaces at work at the mine.

There has been some good gold from Upper Bingera; and ground known as the Wet Lead is now being worked satisfactorily, as one party has a pump at work. The water on this ground has always been an obstacle, and as the class of miners there are not in a position to erect machinery they have to cut races before they can sink for the gold, which absorbs labour, time, and what little capital they possess. The season hitherto has been favourable for this particular locality, as from the small quantity of rain they have not had the same body of water to contend with they would otherwise have had. There has been a fair reef opened in this locality (specimens from it were forwarded to you by me some short time since), but from the want of proper machinery to extract the gold I am afraid a great deal will be lost, as the gold partakes of the character of that known to miners as "mustard gold." There are from forty to fifty men working at Tea-tree Creek, Reading's Reef, Paling-yards, Wood's Reef, Ironbark, and Crow Mountain. With the exception of the last place, the men are only making wages, and, like the rest of diggers, live in hopes of a good find. And here I would remark that this portion of the Peel and Uralla Mining District has large mineral resources which must remain unveiled till we have a larger amount of capital—a more energetic and enterprising class of miners than we have at present.

Fletcher's Reef, at Crow Mountain, has given a good return. The following are the crushings:—

15	tons stone yielded	...	155	ounces.
18	„ „	...	284	„
45	„ „	...	94	„
64	„ „	...	20½	„
24	lbs. specimens yielded		84	„

This is a quartz reef E. and W., lay N.; depth of shaft, 60 feet. Gold-bearing quartz struck 26 feet from surface.

During the year 1878, 1,200 ozs. of gold have gone to Sydney. Other parcels have gone by private hands, of which I cannot get an account.

PEEL AND URALLA DISTRICT—INVERELL DIVISION.

(*Mr. Warden Fraser, P.M., Inverell.*)

In submitting my annual report of the tin-fields of the Tingha portion of the Peel and Uralla Mining District, I regret to state that operations to a very limited extent have been carried on. Two causes have tended to promote this state of affairs, viz., the general depression in trade and the inadequate supply of water, the latter being an absolute necessity in mining operations.

Although the drought has apparently broken up, its effects are still felt by the miner. Our creeks have only been running three or four times during the last twelve months, and then only for a very few days at a time, the parched earth absorbing most of the rainfall. I trust, however, that we have now felt the worst of the effects of the drought, and that with the present year an abundant supply of water may inspire us to prosecute our labours with renewed vigour.

In fresh discoveries nothing new has been found, although a good deal of prospecting has been carried on during the past year. I believe in some instances expectations will be realized, and good returns for labour obtained.

The recent water regulations have only been availed of in one instance. This, I think, can be fairly charged to the drought, the race constructed not bringing any supply to its owner. On back claims stacks of wash-dirt still await a water supply, present rates not permitting the expense of carting to the creek.

The recent proclamation reserving a large area of this field from sale for tin-mining operations is generally approved of amongst miners; and I think that with liberal regulations a mining community might be induced to settle on this field capable of developing its vast resources, and thereby contributing largely to the public revenue. Some of our best miners have left the field, and unless sufficient inducements are held out there will be none left to open out our buried wealth. Even the Chinese population is on the decrease, and they, mere copyists, only follow in the wake of the European pioneer.

M'Intyre River.

The famed mines of Elsmore and Karaula, on this river, are again at a standstill, experienced managers and tributers having failed to earn salt for their kail. Owners expectations have not been realized.

PEEL AND URALLA DISTRICT—GLEN INNES DIVISION.

(*Mr. Warden Martin, P.M., Glen Innes.*)

WITH the exception of the settlement of about 300 Chinese tin miners on Skeleton Creek and at the head of the Severn River, but little alteration has taken place since January, 1878, in the numbers engaged in mining within the area referred to in my previous annual report.

At Oban and at Glen Elgin a few miners are still carrying on operations in the alluvium for gold; but at Starlight Reef, near Oakwood, nothing has yet been done to practically test the value of the stone, although it is said a crushing plant will shortly be erected on the ground.

Near Wellingrove a trial shaft is being put down on the lode of argentiferous galena referred to in my former report, and in the event of the prospects proving favourable, it is the intention of the proprietors to invest an adequate capital in working the mine.

The lode of bismuth known to exist has not been touched, nor does there seem any likelihood of capital being embarked in its development.

Within the mining district of Vegetable Creek (now included in my division) the low value of tin in the Home market and the high price of labour on the spot have led to the abandonment of much mineral land in outlying localities, and, combined with the long continued dry weather, to restriction of production at the mines in the more immediate neighbourhood of the township of Vegetable Creek.

At Messrs. Hall Bros.' very complete mining establishment at Kangaroo Flat alone has work been carried on throughout the year, in consequence of a sufficiency of water having been stored to keep its crushing plant continuously at work.

The Vegetable Creek Tin-mining Company at Graveyard Creek have not been so fortunate, and want of water has at times caused a suspension of work, and enforced idleness on the larger staff of men employed by that Company.

However, notwithstanding much discouragement the output of ore from the tin mines in the Vegetable Creek District has not fallen below the amount recovered in the previous year (as will be seen on reference to the report of the Mining Registrar, Mr. Gower); and as the deep leads at Y. water-holes, Graveyard Creek, and Kangaroo Flat are more opened out, it is reasonable to expect recovery of a larger amount of ore during the coming year.

At the Glen Tin Smelting Works at Tent Hill 622 tons of ore, at an average cost of £32 10s. per ton, were received for reduction during the year, and from fifteen to twenty men were employed getting firewood, making charcoal and fire-bricks, and in smelting ore. Originally the fire-bricks required in these works were brought from England at great expense, but now they are made on the premises from a decomposed granite similar to the China-stone of Cornwall, which is found abundantly in the near neighbourhood. From these works 214 tons of refined metal were forwarded to the English market, by way of Warwick and Brisbane, as being the cheaper and speedier route. The remainder was sent by way of Grafton and Sydney.

About 360 Europeans and about 700 Chinese miners are working (mostly on wages) in my division, and their earnings vary from £1 5s. to £1 15s. for Chinese, and from £2 to £2 5s. for European labour.

Some work for less wages than £1 5s. per week. Europeans alone are employed in those mines where the leads are deep; but Chinese appear to succeed best where heavy work is done in open excavations, as at Skeleton Creek—once entirely in the hands of Europeans, but now as exclusively occupied by Chinese.

From this last-mentioned locality about 300 tons of tin ore have been recovered by Chinese labour during the past year.

I cannot ascertain the quantity of gold obtained by those engaged in that mining industry during 1878, but the number of miners did not exceed 20, and their average earnings I should say were about £1 10s. per week per man.

PEEL AND URALLA DISTRICT—DUNGOG DIVISION.

(*Mr. Charles Graham Smith, P.M., Dungog.*)

WITH reference to your circular letter of the 18th December, 1878, I have the honor to report that mining operations have not progressed sufficiently to enable me to fill up the printed forms forwarded to me; I hope, however, to be able at an early date to furnish a favourable report of the prospects of the district, as there are several parties who mean work and are sanguine of success; prospecting at Sugarloaf and Little River respectively, five-and-twenty miles from Dungog. The Geological Surveyor has expressed a favourable opinion of the Sugarloaf formation, but the bulk of the prospectors prefer the Little River, where gold shows freely in the quartz, a ton of which is to be forwarded to Sydney as soon as it is got out.

The only other locality where there is any mining work is on the Commons Reserve. Mr. Thomas M'William is there sinking for silver ore, and, from experience gained in other countries, he feels justified in being sanguine that present appearances promise good results. I forward herewith his report of the workings. The package of specimens to which he alludes will be forwarded to you by first favourable opportunity.

(*Report of Mr. Thomas M'William.*)

I have the honor to acknowledge the receipt of your circular of the 28th ultimo, requesting the fullest particulars of my mining operations, either in the form annexed thereto, or any other more convenient form, as a contribution towards making known the mineral resources of the Colony.

In reply, I have to state that having had to sink through rocky filling-matter I am only now at 37 feet—at the settled part of the lode.

In the course of sinking I have raised 3 tons of inferior stuff and 10 cwt. of picked stone. I am making an assay of a portion of the latter, but as the process, the Mexican method, is a tedious one, it will be quite impossible to state the result within the time, viz., to the 6th instant.

I have, however, made up a small package of the best specimens that I have obtained at the depth reached. They show that the associated gold, as well as the native silver, will increase with sinking, and, such has been the improvement in the last few feet, I quite expect to have some specimens worth exhibiting at the International Exhibition.

The lode occupies the fissure of a fault, as evidenced by the subsidence of the strata on the hanging-wall side, and there has also been movement, in a horizontal direction, of the strata on the foot-wall side, as evidenced by the polished surface of that wall, and the direction of the striœ. An eruption of porphyry that has occurred near the course of the lode appears to have been the cause of the latter movement. A small portion of the foot-wall at the 37th foot accompanies the specimens.

Would it not be advisable, for the information of the public, that the sample sent should be assayed in Sydney, as was done in the case of the Boorook silver-bearing quartz? Not only would the value of the lode in the Common at Dungog be made known thereby, but prospectors throughout the Colony would learn that crystalized carbonate of lime is a matrix for silver and its ores in New South Wales as in Mexico.

BARRINGTON GOLD-FIELD (COOLONGOLOOK.)

(*Mr. Warden Rowling, P.M., Bullah Delah.*)

I HAVE the honor to forward a report of gold-mining operations on the reefs in this neighbourhood to the 31st December, 1878.

2. Specimens of quartz containing gold have from time to time been picked up at a spot known as Coolongolook, but no active steps were taken to develope the auriferous value of the locality until the 18th November, 1878, when Messrs. Donaldson and Cassidy applied for a prospecting claim, since which period the field has been steadily progressing.

3. Twenty-three leases, embracing an area of 91 acres, have been applied for, and forty-one miners' rights have been issued to this date; the latter would however seem to be no reliable test of the population actually engaged in mining here, which may be estimated at nearly 100, many of whom are no doubt holders of miners' rights supplied at other places.

4. The Coolongolook Quartz Reefs certainly possess many great and solid advantages, being within 2 or 3 miles of navigable waters, thus rendering communication with Sydney, *viâ* Forster, easy and inexpensive, a Post Office and Public School already established in the vicinity, and a good township site selected, with an abundant supply of excellent water, the climate is good, and the unsuccessful digger here could scarcely fail to find employment in the extensive timber trade of this district.

Back Creek, Barrington Gold-field.

Mr. C. S. Wilkinson, geologist, in his very able and exhaustive report, recently furnished to you, which I doubt not will be included in the Annual Report, embracing as it does all matters of detail relating to the Barrington Gold-fields, and which otherwise would fall within my province, renders it unnecessary for me to recapitulate that which he has advanced, and which I can fully endorse, further than to urge upon the Government the necessity of stringent sanitary arrangements and immediate provision for a water supply.

NEW ENGLAND AND CLARENCE DISTRICT.

(*Mr. Warden Graham, P.M., Tenterfield.*)

I DO myself the honor to submit my annual report on the mining district under my charge for the year 1878.

It is with great satisfaction I have to report that the prospects in mining in this portion of the New England and Clarence Mining District are more encouraging than they have been for some years. The discovery of payable silver alone promises to be of great importance, and a new and invaluable addition to our mineral resources.

The extent over which payable silver exists in this district is, as far as we at present know, sufficient for the employment of a very large number of miners, and I have no doubt but that further prospecting, aided by the knowledge that is daily being acquired by the miners, will develope even larger, and perhaps richer deposits of that mineral than have already been found.

The gold-mining industry is also more prosperous than it has for some time been, and several old abandoned claims are now working with remunerative results; this is very satisfactory when taking into consideration the long protracted drought and the disadvantages which the miners have lately had to contend against. It must be remembered that in this portion of the district very little capital has been expended in machinery, prospecting, or developing gold mines. The whole district can boast of but very small amount of machinery or treating plant.

During the last year seventy-seven (77) applications have been made for gold-mining leases. Nearly the whole of them are for land at Boorook, and are for the purpose of mining for gold and silver combined. They are applied for under the provisions relating to gold-mining leases.

I had some little difficulty at the rush for land at Boorook to induce the applicants for leases to apply for gold-mining leases instead of taking the land up in large areas under mineral licenses or leases. If mineral leases had been allowed, the whole country would have been monopolized by a few persons. I considered it my duty to inform the intending applicants that I would be compelled to report unfavourably on any applications for mineral leases where

I was of opinion the land contained a fair average of gold. I am glad to say the miners accepted my view of the matter, and although there was a rush for land not a single case of dispute exists.

In consequence of the surveyor in whose district Boorook is situated not being able to survey the land within a reasonable time, I suggested the transfer of instructions from him to Mr. Mining Surveyor Drummond, who is now on the ground proceeding with the work. He has now nearly completed, and informs me that he has had no difficulty or dispute with reference to any of his surveys.

Boorook.—The only machinery at present at Boorook is a small crushing plant, owned by Messrs. Horton and Funnell (who may fairly be considered the pioneers of silver-mining at that place). It consists of three stampers, a Wheeler's pan, and a Burdan machine. It was, until December last, worked with the Burdan machine only. The stone when crushed was passed over quicksilver tables and blankets, and the washings from the blankets then passed through the Burdan for amalgamation with quicksilver. Under this process the following quantities of stone were treated, viz.:—

From the Addison Reef, 50 tons; yield, 153 ozs.; value, £58 11s 6d.

From the Golden Age Reef, 505 tons; yield, 4,600 ozs.; value, about 4s. 6d. per oz.

By this process I may explain that *only about one-fifteenth* ($\frac{1}{15}$) of the stone crushed was put through the Berdan machine; the remainder passed over the blankets, and became "tailings," so the result above given is that obtained from the *one-fifteenth* of the stone; the the amalgamating or quicksilver tables were useless, and the only amalgam was obtained from the Berdan machine. On testing the "tailings" it was found that they were as rich as the stone before treatment; it then became evident that the blanket-saving process was a mistake—the silver ore being a chloride was as light as the ordinary sludge, and the blankets could not save it. Mr. Horton, in December last, erected a "Wheeler's pan," and has since treated the tailings with it. He had over 400 tons of tailings saved in pits. The result of this working has been, in comparison to the previous process, very satisfactory, for from 95 tons of tailings 2,000 ozs. of silver have been obtained. Two tons of tailings after treatment with salt and exposure yielded 66 ozs.

The engine is now employed working the Wheeler's pan only on the tailings. Crushing has been stopped for some time past, and will not be recommenced until after the lot of tailings have been treated. Even under the present Wheeler's pan process, although comparatively satisfactory and remunerative, a great loss of silver occurs. In order to properly treat with Wheeler's pans for the saving of silver, there should be a set of pans and a separator; a set consists of a pan for grinding and one for amalgamating. By this process a very much larger percentage of silver will be obtained.

It will be seen from the foregoing that the Golden Age stone yielded by the first process (Berdan) about 9 ozs. to the ton, and the tailings about 20 ozs.. If this average continues through the lot of tailings (which I have no doubt but that it will do, if it does not far exceed it), it will give the handsome total yield of about 15,000 ozs. of silver, or about 30 ozs. to the ton.

Mr. Horton is at present purchasing more Wheeler's pans and a separator, and I feel confident a vast improvement will soon be made in the saving of silver.

From various assays that have been made of the Golden Age stone, the average value would be over 100 ozs. of silver and 1 oz. of gold to the ton. I will here quote a few of the most reliable assays:—

	ozs.	dwts.	grs.	
No. 1, stone, assayed by Government Assayer, from 30-feet level, Golden Age	80	1	0	silver
	0	9	14	gold
No. 2, stone, assayed by Government Assayer, from 50-feet level, Golden Age	98	16	19	silver
	1	4	0	gold
No. 3, crushed stone from battery, taken at intervals and mixed, from 30-feet level, assayed by Government Assayer	83	12	19	silver
	1	0	0	gold
Stone—Sample taken from 2 tons forwarded to Sydney for treatment, assayed by Mr. Watt, chemist ...	143	0	0	silver, about
	0	14	0	gold
Stone—Sample taken from 2 cwt. from the 50-feet level, assayed by Mr. Bensusan, on 6th instant	98	13	0	silver
	3	12	0	gold

The stone is a fair average all through, and I have no doubt but that when it is properly treated it will yield over the average value I have estimated. The ore is a chloride of silver, no metallic silver visible, but can be shown rich by burning in a forge. It is gradually improving in value from the surface down. There are two shafts on the reef, each 50 feet; very little stoping out has been done, in fact, nearly all the stone treated has, I am informed, been obtained from the shafts. The reef averages over 3 feet wide.

What is known as the Golden Age Reef is supposed to be a continuation of the Addison Reef, and probably a junction with a reef known as the Golden Crown. A large number of leases have been applied for on the reefs, and on nearly all the leases the reefs either crop or have been discovered.

Nothing has been done on the Addison lately, with the exception of some assays. There is a shaft down about 50 feet, showing a well-defined wide reef. I should estimate it to average over 4 feet. The following assays which have been made of stone from it prove it to be a valuable reef:—

	ozs.	dwts.	grs.	
Stone from 30-feet level, assayed by Government Assayer, 26/6/78, No. 24	522	2	0	silver
	18	2	10	gold
Stone from 50-feet level, assayed by Mr. Bensusan, on the 6th instant	514	9	14	silver
	16	6	16	gold

The ore is, as far as I can ascertain, a sulphuret of silver, and is much more difficult of extraction than the chloride. There is no process on the ground yet by which it can be treated. The Wheeler's pan does not seem to be the proper process. It will probably require smelting.

About 10 or 15 chains south-westerly from the Addison is the prospecting shaft on the Golden Crown Reef. This reef runs nearly parallel to the Addison and is supposed to junction it near the Golden Age. It is very rich in silver and gold. The following assays have been made:—

	ozs.	dwts.	grs.	
Stone from the Golden Crown Reef, surface, assayed by Government Assayer	459	16	0	silver
	5	11	14	gold

Stone from 25-feet level, 1½ cwt., crushed and treated at Tent Hill Tin Smelting Works, yielded 400 ozs. of metal to the ton.

This metal would contain gold and silver only; the relative quantities were not tested.

The reef has been taken out for about 18 inches wide, but no foot-wall is yet found. The prospecting shaft is down about 30 feet, and the reef still looks well; it has a westerly dip of about 1 in 4; the hanging-wall is slate, and well-defined. The reef runs about north and south. A large extent of country has been taken up on the line of this reef, but very little work in the way of prospecting has been done. Intersecting the Addison and Golden Age Reefs is a reef called "The Grand Junction"; it bears about 35° east of north. The prospecting shaft is on a 2-acre lease, held by Brown, Murray, & Co., and is, as far as I could judge, between its intersection with the Addison and Golden Crown Reefs and about 20 chains south from the Addison shaft. The shaft was down about 10 feet, and showed a well-defined reef, about 1 foot wide, with very good-looking stone, which on being burned showed good silver. About 2 chains from this shaft, in a S.-S.-westerly direction, or S. 35° W., there is another shaft on this reef, on a lease applied for by Yates and party. The reef here is well-defined and about 15 inches wide; shaft about 10 feet deep. I saw some good specimens of burned stone from this reef, showing good silver. To the south of these reefs, apparently on the same line as the Addison, a new reef has been discovered by Honeyman and party. It had only just been cut when I saw it. The stone had all the appearance of the Golden Age stone, but no assay or test had been made of it.

Various reefs have been discovered to the east of the Addison, the principal of which are the Silver Age, Clifton, and Oriental. These reefs are well-defined as far as they have been prospected on, and show good stone. No reliable assays have yet been made, nor has any of the stone, as far as I know, been tested. I am informed that gold is plainly visible in the stone in the Clifton, and that in washing the casings of the reef native quicksilver has been found.

I can give no satisfactory report on these reefs until they are better developed. There are various other reefs in the vicinity on which leases have been applied for, but they are as yet undeveloped, and very little information can be obtained about them.

On the east of the Golden Crown Reef a very promising reef, called the "Tenterfield," has been discovered; no test of the stone has yet been made. South again is a reef which has all the appearance of being of great value; it is called the Moffatt Reef, and is about 5 feet wide. I have been informed by those interested that the stone yields over 150 ozs. of silver to the ton. In the same vicinity there are various other reefs: The Compstock, Happy Valley, Caledonian, Copenhagen, Curran's, and others, on which, from their undeveloped state, I am not in a position to give any reliable report. The whole country in this locality is intersected with reefs, most of them silver and gold bearing.

A new reef has been discovered about half-a-mile north of Horton's machine site. It is known as Gay's Reef. It is fully 5 feet wide, and well-defined; the stone looks rich, but no assay or test of it had been made when I was on the ground. Again, to the north-west of Horton's machine, about 3 miles distant, two well-defined reefs, called the Woolshed and Alderman, have been opened up. The stone shows rich silver when burnt; and some surface stone from the Alderman, from an assay made by the Government Assayer, yielded 37 ozs. 15 dwts. 14 grs. silver and 9 dwts. 5 grs. gold to the ton. Since the reefs have been sunk on the stone has considerably improved. The proprietors of the prospecting claim on the Woolshed Reef have great confidence in the richness of their holding. The reefs are well-defined, and average about 2 feet wide.

On all this vast area of rich silver-bearing country, which has now been discovered and to a great extent proved for some months, there is at present, as I have previously stated, only one Wheeler's pan at work and only about forty or fifty miners engaged. The difficulty of getting capital in mining speculations, no matter how good the promise of success is, is so great that it has been as yet impossible to get the necessary machinery to give the field a fair start. It is useless to expect the working miners to do much without assistance, as nothing can be done without an expenditure of capital far beyond their means. I am glad to say there is now a better prospect of a start being made. Since I commenced this report I have heard Mr. Horton has succeeded in arranging for six more Wheeler's pans and another engine. There is also a prospect of three other machines going on the ground early this year; if this is the case, I have great confidence that before the end of this year Boorook will have been proved to be one of the richest mining fields in the Colony.

A great drawback at present to the advancement of the mines is the ignorance of the holders as to what is the best method of treating their various ores. The mineral takes so many forms that the same machinery would probably not be able to treat all the ores successfully; reliable information is required before machinery should be procured. Such information can only be obtained from experienced silver-miners or from experts as to the nature of various ores, and the best process of extracting the precious metals. A geological survey or inspection of Boorook would add greatly to the information of the miners and general public, and would probably inspire more confidence in these mines than at present exists. I would respectfully recommend that such survey or inspection be made as early as possible.

The whole of the land taken up at Boorook has been applied for under lease. Although generally the monopoly of land under the leasing system on gold-fields is objectionable, it is not so much so in this case; it is not like gold-mining, as there are no means of treating the stone when raised, and the lapse of time until the labour conditions are necessary has been a boon to the *bonâ fide* prospectors and miners. If such had not been the case, and the land had been taken under gold-mining "claims," which would have necessitated immediate and continuous work, the prospectors who had devoted their time and money in prospecting would in many cases have had to abandon their ground in consequence of not being able to continue working with so distant a prospect of remuneration, and their "claims" would pass into probably no better and less deserving hands. So under the peculiar circumstances the leasing system so far has been a boon. No doubt many of the leases are applied for by the same people, and a comparatively few persons hold very large interests—this cannot now be helped. Payable silver has been known to exist at Boorook for over a year, and the place has been sufficiently made known to the public.

As soon as the labour conditions of the leases can be enforced it will necessitate, if all the leases now taken up are worked, the employment of between 300 and 400 men. No doubt a great many of the leases will be forfeited, and opportunities will then exist for the distribution of the land amongst a greater number.

Very little energy has been shown in prospecting new country; in fact, little or nothing has been done outside the vicinity of the already discovered reefs.

I forward to you, per Cobb & Co., a few specimens of stone from the following reefs, which I would suggest be assayed, especially the last four, as no previous assay has been made of them:—

No. 1.—Golden Crown, prospecting shaft, 25-feet level.
No. 2.—Grand Junction, prospecting shaft, 10-feet level.
No. 3.—Grand Junction, Yates's lease, 10-feet level.
No. 4.—Honeyman's Reef, surface.
No. 5.—Addison Reef, between the Addison and Golden Age shafts, 5 feet.

At Lunatic and Perseverance there are four (4) claims at present working, and a new reef, called the Victoria, has been discovered in that locality showing good gold; the miners are at present making wages "hand-crushing."

The Dalmorton Reef, at Lunatic, is working with good results—10 tons of stone lately crushed yielded 3 ozs. gold to the ton. On Shoobert and Company's claim, on the Lunatic Reef, there is now about 80 tons of stone to grass awaiting repairs to the crushing plant; it is expected to yield well. An antimony mine is also working in this locality with profitable results.

At Tooloom very little mining has been done during the last year. The Pioneer Quartz-mining Company are now down 195 feet. They have a small water-power battery, but the want of water has prevented them doing much—only about 70 ozs. gold have been won from this claim during the year. It has been registered for some time for water.

It appears from the report of the Mining Registrar at Lunatic that about 128 Europeans and 29 Chinamen have been employed in that portion of the district, and that the value of the yield for gold and silver is £11,167. This shows only a small return per man, but it must be remembered that many of the men have been employed in dead work, such as cutting races, fluming, and tunnelling, to bring the water on to Poverty Point, prospecting for and developing silver mines at Boorook, &c. I should estimate that not more than 100 men have been actually employed during the year in obtaining gold and silver; this would bring the average up to about £2 2s. per week per man. I hope to see a new start made at Lunatic as soon as the crushing plant is in working order.

I visited Timbarra and Poverty Point to see the important works now being carried on there by the Surface Hill Sluicing Company, for the purpose of bringing water to hydraulic sluice numerous auriferous granite dykes in that vicinity. Poverty Point is situated about 30 miles south-east from Tenterfield, on a high mountainous spur, dividing the waters of Demon and M'Leod's Creeks, and terminating precipitously at the Malara or Rocky River, the fall into which is over 2,000 feet. The country is of granite formation. The auriferous dykes of granite are on the top of the spur, thus necessitating a large outlay of money to bring on water, as only the heads of the creeks and swamps along the top of the range can be taken. In order to secure sufficient water, races have been cut, extending altogether over seven (7) miles, and very heavy expenditure in erecting fluming has been necessary. The fluming is now completed, and consists of three-quarters (¾th) of a mile zinc fluming across a valley, the highest part of which is 60 feet, and the average height about 40 feet—30 chains of ground fluming, from 2 to 12 feet high, and 20 chains of fluming 30 feet high. The most expensive piece of work is a tunnel through a hill, the total length of which when finished will be over 50 chains; about 14 chains have yet to be done to complete it. At present it is in hard diorite rock, and the work is expensive and slow; it will probably be six months before it is completed. This has been a very great undertaking, and the work up to the present time has cost the company nearly £4,000. When finished a good supply of water will be obtained, and I have no doubt the company will be rewarded for their enterprise. The water will be brought on at about 50 feet above the level of the works, giving plenty of fall for hydraulic sluicing.

The amount of ground held by the company is about 20 acres, and through this numerous belts or dykes of soft granite run, containing fine gold. From assays made, it is supposed the granite will average 7 or 8 dwts. to the ton. The supply appears to be unlimited, and for some considerable depth will be easily cut away and sluiced with hydraulic sluicing. The dykes run about N. 30° W., between walls of hard granite boulders; they are from 20 to 30 feet wide, and have in some places been tested to 50 feet deep. Work has been carried on in these dykes for the last sixteen years, and proved very remunerative as long as the water lasted. Large cuttings into the dykes have been made, and a very considerable quantity of stuff has been washed. The hard granite boulders contain the same percentage of gold. The granite is composed of coarse, dark-coloured quartz, decomposed felspar, and no mica. I forward you a sample of the stone.

The gold-bearing granite extends for miles along this range of mountains, and is again picked up across the gorge of the Rocky River, at Malara, where rich alluvial deposits have been worked.

On the old Timbarra there are a few people working, principally Chinamen. A Chinese party have also got a rich claim at Poverty Point, in similar granite to that already described. Granville, Vickery, and party have also got rich, soft granite dykes similar to those in the Surface Hill Company's land, but their water supply is bad, and they can only work in wet seasons.

For information respecting Dalmorton, Solferino, and Cungi, I beg to refer you to the Mining Registrars' reports.

Tin.

Tin-mining in this district has been steadily on the decrease for some time past. The rich alluvial deposits have to a great extent been exhausted. The low price of tin and want of water for sluicing purposes have also seriously affected the output of this mineral. The yield of ore for the year 1878 from the Maryland Mines was only 1,107 tons, the value of which on the ground would be about £34 per ton, giving a total value of £37,638. There were about sixty-five Europeans and 457 Chinamen engaged in mining.

I do not expect to see much improvement in these mines until more favourable seasons and a better market. No new discoveries of any importance have been made on this tin-field during the past year.

Sample No. 30, from Golden Crown Prospectors' Shaft, Boorook, consisting of quartz with bright red oxide of iron, sulphides, and chloride of silver, contained—Silver, 284 ozs. 13 dwts. 14 grs. per ton; gold, 4 ozs. 5 dwts. 14 grs. per ton.

No. 31, from Grand Junction Prospectors' Shaft, Boorook, consisting of quartz with oxide of iron and iron pyrites, contains—Silver, 5 ozs. 10 dwts. per ton; gold, 1 dwt. 15 grs. per ton.

No. 32, from Grand Junction, Yates's lease, is similar in appearance to 31, but contains silver as chloride, and yields—Silver, 124 ozs. 12 dwts. 19 grs. per ton; gold, 17 dwts. 5 grs. per ton.

No. 33, from Honeyman's Reef, consisted of two different specimens—first, dark-coloured quartz; second, of a reddish, decomposed quartz, and yielded—Silver, 1 oz. 16 dwts. 10 grs. per ton; gold, 19 grs. per ton.

No. 34, from Addison Reef, consisting of white quartz with oxide of iron and traces of sulphide of iron (iron pyrites), contained—Silver, 16 dwts. per ton; gold, 10 grs. per ton.

NEW ENGLAND AND CLARENCE DISTRICT.—LISMORE DIVISION.

(*Mr. Warden Elliott, P.M., Lismore.*)

I HAVE the honor, in compliance with Regulations, to report upon the present state of mining in this division.

Some months back I had reason to believe that I should have to report considerable progress, but, owing either to the late continued dry weather or the lack of energy on the part of the residents of the division, nothing has been done of which I can obtain any reliable information.

There is no doubt but that the district is highly mineral, and practical miners would be attracted if a reliable geological survey could be made.

(*Mr. Warden Grant, P.M., Bourke.*)

I HAVE the honor to report that during the past year only one miner's right has been issued for this district. No gold-mining has been carried on at all during the past year. With reference to the state of the Great Cobar Copper Mine I can give no definite information in the absence of annual returns from the mine, which have been applied for three times, but not received. I believe that a considerable quantity of new machinery has been erected, and two or three new furnaces have been opened.

There is little prospect at present of gold-mining being prosecuted in this district.

MINING REGISTRARS' REPORTS.

BATHURST DISTRICT—BATHURST DIVISION.

(*C. E. B. Maybury, Mining Registrar.*)

In submitting this my annual report upon mining operations within the Bathurst Division of the Bathurst Mining District during the year that has just closed, I regret to state that the assistance hitherto accorded me by the proprietors of mines and other persons working at or interested therein, in the collection of the necessary particulars for completing a report of this kind, has not this year been received, and I am consequently unable to furnish the details I desired, and which I have hitherto supplied.

Gold-mining.

This branch of mining industry has in no way improved since the date of my last report, and I am not aware of any circumstances likely to cause a reaction during the year upon which we have now entered. If the district could boast of miners more possessed with the spirit of enterprise that would induce to a thorough prospecting of the auriferous portions thereof, I might to-day be in a position to furnish important statistics of work performed and results achieved, instead of writing as I could almost do—"nothing to report."

With the exception of the operations carried on by small claimholders and prospecting parties at Glanmire, Clear Creek, Swallow's Nest, and King's Plains, there is really nothing doing. Even these operations are so unimportant as scarcely to be worthy of mention, and the Chinese have it chiefly to themselves. The wages made are very small; and during the harvesting season work is entirely suspended, both European and Chinese finding it very easy to obtain more lucrative employment. The number of miners' rights issued is yearly becoming less, though, so far as I can learn, the mining population continues about the same, a fact pointing pretty conclusively to the supposition that the law in this particular is being evaded, and the revenue defrauded.

I learn from the gold receiver at Bathurst that the quantity of gold transmitted by Escort from Bathurst to Sydney during the year ending 31st December, 1878, amounted to 2,789 ozs. 11 dwts. and 19 grs., showing a decrease on the previous year of 1,111 ozs. 9 dwts. 12 grs.

Copper.

My report upon the copper mines situate within this division must be more general in its character than it has hitherto been, owing to the reason assigned in my opening remarks.

Cow Flat Mine.—This is the largest and most important mine in the district, and its work has been carried on without cessation during the whole of the year. It has given constant employment to upwards of thirty men, and the quantity of ore raised has been from 80 to 100 tons per month, yielding on an average about 8 per cent. of copper. The ore averaged in value about £3 per ton, and was disposed of to the Esk Smelting Company. The depth of the shaft is upwards of 30 fathoms, and the width of the lode varies from 6 inches to 10 feet.

North Wiseman's Mine.—This mine, situate at Wiseman's Creek, some 30 miles from Bathurst, is also in full work. The main shaft has been sunk to the depth of 27 fathoms, and at that depth they are now driving a new level. Twelve workmen are employed, and the machinery used consists of a horse-whim, in value about £150. The quantity of ore raised averaged from 30 to 40 tons per month, and yielded about 8 per cent. of copper.

The South Wiseman's and the Apsley Mines.—During the first few months of the year both these mines were worked on the surface for carbonates. Neither has been sunk to any greater depth since the date of my last report, and operations have been wholly suspended for the last few months, owing to the impossibility of working poor ore at the present low price of copper.

Belmore Mine, near Cow Flat.—Not much work doing, the ore raised only averaging about 7 or 8 tons per month.

Northumberland Copper Mine.—This mine, situate at Dirty Swamp, has not been at work for some time. I have heard various reasons assigned for the cessation of operations—one is that foul air is the obstacle, another that scarcity of ore is the drawback, and a third, that the low price of copper prevents it being successfully worked. I am not in a position to say which is the correct version.

Green Swamp Mine.—Operations ceased. I am informed that the mine is worked out.

Iron.

In my last report I referred to the discovery of iron at Back Creek, on land held as a mineral lease by Messrs. Geo. Hayton, Michael Bowler, and Michael Toomey. The mine is situated within 300 yards of the railway station at Back Creek, now called Newbridge. A company, calling itself "The Great Gulf Iron Company," was formed to work the ground, but the result so far has not realized the expectation of those interested, for in consequence of the low price of iron, and consequent stoppage of the smelting works at Lithgow, nothing has of late been done at the mine. The ore, however, is said to be very rich, and I am informed that it is estimated to yield about 70 per cent. of iron. This fact has had a soothing effect upon the shareholders in the disappointments they have met with, and they are still hopeful that "there's a good time coming."

Population.

The mining population has not, so far as I can learn, been materially affected during the year, though there is some decrease in the number of mineral miners, owing to the closing of the copper mines already specified. The following may be taken as a fair approximate:—

		European.	Chinese.
Gold-miners	Alluvial	30	50
	Quartz	12	20
Other Miners		80	...
	Total	122	70

BATHURST DISTRICT—TRUNKEY DIVISION.

(*Thomas Waldie, Mining Registrar.*)

I HAVE the honor to submit my fourth Annual Report of the Trunkey Gold-field, and in doing so I am desirous to show that the field is as prosperous as it has hitherto been; and considering the number of miners employed, the returns, as will be shown, are highly satisfactory as far as the quartz mines are concerned.

There is one serious drawback to the prosperity and the advancement of quartz-mining which is much felt—the most of the best reefs are completely locked up from the prospector by being held under lease, and not a single miner working on the leases in the employ of those who hold them. As will be seen from my previous reports, the principal part of the ground being worked is on tribute, and as naturally may be expected, when the tributers meet with any difficulty which would require an outlay of money, or an amount of what may be called "dead labour," they immediately leave the ground, as they say the ground is not theirs, and perhaps when they have done a lot of work and come upon anything good, then the leaseholders would step in and either force a heavy tribute or drive them from the ground. It is a notorious fact that one company hold about 70 acres of the best ground on the field, and it is also a notorious fact that they have not employed any labour for the last thirty months. There has been a good deal of gold won from the ground, but all on tribute. Another company hold a block of ground of about 40 acres, and they have not employed any labour for nearly three years. This ground has been reported upon by some of the most skilful miners in this Colony, to the effect that it is one of the best prospects in it; and until some steps are taken by the Department of Mines to remedy this crying evil, so long will we continue to drag along rooting the ground instead of mining.

We have three crushing machines upon the field, only one of which is employed in crushing, and that only at intervals.

The present state of things, as regards holding land under lease without working, is, and has been, a great drawback to this field. Concerning the Prospecting Vote, the universal opinion held is that a certain amount of money should be voted to prospect the best reef on a particular field—say that £5,000 was voted to be spent on this field, on which we have three lines of reefs, which have been worked to a depth of from 300 feet to 500 feet—that a proper officer be appointed to collect statistics of the actual returns and the character of the ground, and that one be fixed upon, and the amount voted be expended in prospecting that reef alone, irrespective of the depth. For instance, we have here three lines of reef upon which deep shafts have been sunk, viz., the King of the West (or originally Wilson's Reef); here a shaft has been sunk 530 feet, and, as is well known, first-class in the bottom. Then on No. 7, Crummies', another line, a shaft has been sunk 300 feet, with good results; and the Pioneer line, where a shaft 240 feet has been sunk. Now either of these lines being proved payable would most undoubtedly affect the whole field, and without some such inducement is held out an immense amount of wealth must remain hid in the bosom of mother earth.

With regard to alluvial mining, the general opinion of the miners is that the mining interest could be very much assisted by a supply of water for mining purposes. There is plenty of payable ground here if only a water supply was available. They say they are mostly dependent upon storm water, and it is uncertain—that they would not be justified in getting the wash-dirt, as it might be months before they could wash it. On the Mountain Run two puddling machines have had to be abandoned, not for want of payable dirt, but for want of water to wash with. I stated in my report for 1875 that there was sufficient payable ground in this division to support a population of from 10,000 to 15,000 people for many years, and that opinion still holds good; and the anxious desire of the miners of this part of the Colony is that the day is not far distant when the Government will see their way clear to afford the means necessary to take the gold from the bowels of the earth and apply it to its legitimate use.

Quartz.

The numbers employed in quartz-mining continue the same as last year, and the returns about the same. At the south end of the township quartz-mining is a little more active, owing to a party of miners who came here at the latter part of the year and commenced work in ground that had been abandoned for a very long time, when they were rewarded with a return of over 2 ozs. per ton from 15 tons of quartz, taken out in a few weeks. Another party has been at work some time in the Old England tunnel, for some time abandoned. Bennett and party are also pushing ahead with their tunnel, and expect to reach the gold in a few weeks.

In alluvial the washing has been much retarded through the dry weather, but on the whole the returns are fair. A fresh party has commenced operations on what is known as Gum Flat, in the Mountain Run District, and are sanguine of being recompensed for their work.

BATHURST DISTRICT—TUENA DIVISION.

(*S. J. Cotter, Mining Registrar.*)

IN alluvial mining there is nothing fresh, and no new ground has been opened, nor have any improved means of working been introduced. Whenever there is a fair stream in the main creek there is great activity, which, as a rule, is well rewarded, but in the long intervals all the men, with the exception of a few European and Chinese fossickers, take to other occupations. The quantity of gold obtained and the number of men employed are much diminished by the last three or four exceptionally dry seasons. When our turn comes for a few wet ones, both will be doubled at least.

The decrease in the number of men engaged in alluvial mining is chiefly amongst the Chinese. There are scarcely more than half the number there was last year; and I fear it is not a matter of congratulation that we no longer find favour in the sight of patient and industrious John. Here alluvial mining still signifies either simple fossicking, washing points out face by means of water brought on from the main and tributary creeks, or sinking shallow shafts and short drives.

The decrease in the quantity of gold obtained during the year is almost entirely in quartz-mining, which seems likely to come for a time to a complete standstill. Work has been steadily kept up at the Washington for Towns & Co., and also by Messrs. M. Ausland & Wark, in their claim, the Victoria. In both these cases the object has been to recover the reef, which having been worked for about a year, and enriching the first proprietors, suddenly ran out. The searchers have come across some rich veins and leaders, just sufficient to keep hope alive, but on the whole their patient toil has been poorly rewarded. Messrs. Nelson & Klower have taken a few tons of good stone, averaging an ounce to the ton, out of a claim near the old Stockyard leases, and Messrs. Wilson & Burton have been prospecting for some months about the Wren's Nest.

The mining industry in this division has sustained its heaviest blow in the collapse of the Peelwood Copper Mine. It is well worthy of note that the company fell with a dignity worthy of the honorable names amongst them, and that the legal manager and directors announced their approaching failure as soon as it clearly could not be avoided. Of course in this case all obligations were promptly met; and if these honorable men found more imitators there would soon be none to assert that "floating a mining company" and "working a swindle" are synonymous terms.

BATHURST DISTRICT—CARCOAR DIVISION.

(*W. B. Warner, Mining Registrar.*)

IN my report for this division for 1877 I drew attention to the fact that mining of all kinds was hindered from the scarcity of water, occasioned by the long-continued drought. This was still true of this district during the first three months of 1878, when the general break-up of the drought gave an abundance of water for mining enterprise. That the want of water was to a great extent the cause of the falling-off in the supply of gold is shown by the Escort returns from Carcoar for the present year, which are appended hereto. It must also be borne in mind that valuable parcels of gold, the produce of this district, are sold in places out of the district, principally in Orange, which do not figure in the Carcoar returns, but go to swell those from other places.

The principal gold mine in my district is the Brown's Creek Company's claim, at Brown's Creek, about 8 miles from Carcoar. During 1878 this company crushed 21,584 tons of ore, which yielded 2,905 ozs. 5 dwts. of gold, or an average of 2 dwts. 16½ grs. to the ton. Much more would have been put through but for several weeks in the beginning of the year the claim was stopped for want of water. Sixty men are employed, and the plant, which is one of the finest in the Colony, comprises 3 steam-engines and 30 head of stamps. The quantity of stuff available for crushing is very great, as the lode or vein is above 150 feet in width, and easily mined.

Above 3 or 4 miles from Brown's Creek, and also on Church and School land, Messrs. Masters & Newton are erecting a very valuable and extensive plant for working a lease there, formerly taken up by O'Shea and party. This plant will not only be capable of crushing and separating gold in the ordinary manner, but will have the most modern apparatus for the extraction of gold from pyrites, of which there is a large quantity on the property. Crushing will shortly commence, by which time something like £10,000 will have been expended in the erection of machinery and in the preliminary operations necessary for opening out the mine. Not far from this claim, the Flyer's Creek, Lumpy Swamp, and Forest Diggings, all alluvial, are situated. These have all benefited by the increased supply of water, and some good parcels of gold have been sent to the Mint from Carcoar, the produce of these localities.

During the year the oldest claim in the district, the Prince of Wales, at Burnt Yards, has ceased working. The old shareholders' interest in the claim and plant having been sold by the Sheriff, a new company was formed to continue operations, but after working for some months the shareholders found themselves over £200 a man losers by the speculation and stopped working.

The only other place in my division where gold has been obtained in any quantity is at Gally Swamp, where Thos. Lane and party have been working a nice little property for some years. During 1878 they raised 1,400 tons stone, which yielded 600 ozs. of gold. This claim is nearly worked out.

Copper.

The Milburn Creek Copper Mine has been working during the whole of the year, and a considerable quantity of regulus has been sent from the mine to be refined at Bowenfels. I understand that the mine looks well, and there is every prospect of its being still worked profitably. No return has been received for this year of the quantity of ore raised or number of men employed, but both must be considerable.

The Coombing Copper Mine has ceased working, the proprietors, Messrs. Lloyd and Samuel, being considerable losers.

During the year I sold sixty-seven miners' rights and two business licenses.

Appendix.

Quantity of gold sent from Carcoar by Escort in the year 1876, 3,548 ozs. 13 dwts. 8 grs.; 1877, 3,043 ozs. 11 dwts. 9 grs.; 1878, 4,666 ozs. 10 dwts.

Quantity of gold sent from Carcoar for each month of 1878—

	ozs.	dwts.	grs.
January	33	18	12
February	193	19	13
March	277	7	1
April	247	13	22
May	410	7	6
June	645	15	20
July	350	6	15
August	602	18	3
September	362	19	6
October	357	15	23
November	425	0	15
December	758	7	8
	4,666	10	0

BATHURST DISTRICT—COWRA DIVISION.

(*John Arkins, Mining Registrar.*)

THERE has been very little gold-mining during the year. In consequence of favourable opinion of Mr. Wilkinson as to value of Woods's Flat Gold-field, several parties proceeded to prospect, in view of reward offered by Mining Department. Only one party of five have as yet reported payable gold. Twenty men are employed prospecting. Mining matters in district during the year have been very dull.

BATHURST DISTRICT—ROCKLEY DIVISION.

(*J. C. Cromie, Mining Registrar.*)

THE mining prospects of the Rockley Division are very dull at present. Quartz reefing is now among the things that were. The alluvial diggings are now almost deserted, the drought of the last few seasons having seriously retarded all ground sluicing. Plenty of the old diggings would still pay wages if the miners had sufficient water to work the ground to advantage.

A great many of the Chinese miners have turned their attention to the culture of the tobacco leaf on some of the old diggings, and in some cases with success.

The Thompson's Creek Copper Mines are the best in the Western District, and promise to last for years. This week some eight more miners have been put on to work by the Company.

BATHURST DISTRICT—ORANGE DIVISION.

(*W. T. Evans, Mining Registrar.*)

THERE is but very little gold-mining, or in fact any other mineral operations in this division. The various localities where any gold-mining is carried on being so far apart it would be conveying a misrepresentation giving the number of "square miles of auriferous ground being, as many have been, actually worked upon."

I herewith enclose the returns handed to me by the Bailiff, who informs me he had great difficulty in obtaining even the very meagre information collected by him.

I can conceive that there is a good deal of "mining plant" not in use, the value of which has not been given.

BATHURST DISTRICT—MITCHELL'S CREEK DIVISION.

(*Samuel Shumack, Mining Registrar.*)

DURING the year just closed mining has been rather dull. At Sunny Corner the Winterton Reef has been at a standstill for nearly three months for want of water, and at times all through the year want of water is the great hindrance to this once valuable claim. I hear now it is about to change hands. Radbourn, Brown, and party are now raising some very good-looking stone from their 10-acre lease at Sunny Corner, and are about to have a trial-crushing. We expect some good returns from this claim.

At the Homeward Bound we expect to have some good stone as soon as Curnow and party complete the tunnel. I must say this is a persevering party; as they are now nearly six months working this drive, it is to be hoped they will be paid for their labour. Just now there is a new rush at a place called Bull Gully; several claims have been pegged out, and some nice prospects turned up. There are tens of thousands of tons of stone on Mitchell's Creek would yield from 4 to 10 dwts., which I think will some day be all crushed. There has been very little done on Mitchell's Creek in crushing for the past year, but there is always a little doing in alluvial, as there is more or less gold everywhere, but nowhere very rich. I hope to have some better report to make at the commencement of the next year.

TAMBAROORA AND TURON DISTRICT—HILL END DIVISION.

(*Alfred B. Burne, Mining Registrar.*)

I HAVE the honor to forward my report for the past year. In doing so I would bring under your notice the almost impossible task I had in furnishing anything like a full, true, and accurate statement of mining and its prospects in this district, from the fact that I have been for so short a time in the district—that I have had neither time nor opportunity to make myself acquainted with mining in all its bearings—and Mr. Warden Sharpe has so fully entered upon all the subjects connected with mining in his report, that I should be only repeating his words were I to touch upon the same subject. I may say, however, that there is no doubt that mining is in a most depressed state at the present time in this district, and I think from three causes—1st, the extreme poverty of the miners generally; 2nd, the great want of capital; and 3rd, the fact of so much land being locked up in leases that are not worked. It is my belief, and the opinion of men here well acquainted with the matter, that there is still plenty of gold in the district that must remain undeveloped for want of capital to cover the outlay of sinking deep enough for it.

There was some falling off in the number of miners' rights issued last year as compared with 1877. In that year the number was 632, and twenty-eight business licenses; last year the number issued was 560, and sixteen business licenses.

The yield of gold in this division of the district for the past year was 12,262 ozs. 0 dwts. 8 grs.; estimated value, £47,515 6s. 3d.

Should it become my duty to furnish a report at the termination of the present year, I hope I may be able to state that mining in this district has had a fresh impetus given to it, from the fact of new and valuable discoveries having been made, and that its past prosperity has again revived.

TAMBAROORA AND TURON DISTRICT—SOFALA DIVISION.

(*M. Fagan, Mining Registrar.*)

DURING the past twelve months mining operations have been greatly retarded in consequence of the scarcity of water. Alluvial operations have been comparatively at a standstill, as the miners could only obtain two or three days' supply of water in the course of three months or thereabouts; and during the summer season all sluicing had to be abandoned, as the races were perfectly dry, the only work done being in a few claims in the bed of the river.

The Circus Point Hydraulic Company have laid in the necessary pipes and siphons in the projected scene of labour at Redbank, about 1 mile easterly from Sofala, but, owing to the cause stated above, have been compelled to defer any further action.

The Spring Creek Gold-mining Company have not yet been able to bring their plant on to the ground. The engine and battery belonging to the New Independent No. 1, Tambaroora, have been purchased by the Company; and a further call of 1s. per share has been made by the Directors to provide the funds necessary for the removal of the machinery, and its re-erection at Spring Creek. Great interest is manifested by the public in the success of this company, as it is considered to be a highly remunerative speculation, and consequently its success will conduce to the welfare of Sofala, being the means of developing the reefs hitherto untried in the neighbourhood.

Wattle Flat.—Quartz-mining at this place has not been carried on with the same amount of perseverance during the past year as in former years, although a few of the *boná fide* miners have been actively engaged on their several holdings. Not one of the Sydney and other companies monopolizing the principal part of this "field by leasing" have spent a penny in the way of prospecting or developing their mines during the year.

The principal locality for quartz-mining is in the neighbourhood of Surface Hill, at the east end of the township.

The old renowned Surface Hill stands conspicuous on the right as the traveller is descending the Turon Hill from Wattle Flat.

This ground is held by Moyles Surface Hill Gold-mining Company. No work has been carried on in this mine during the year, except by a few tributors, who have raised several small crushings from surface veins, giving barely wages; 19½ tons crushed yielded 49 ozs. 2 dwts. 18 grs. of gold.

This company's crushing plant is occasionally employed reducing small parcels of quartz for the public.

South of the Surface Hill Company's ground is situated M'Kenzie and party's lease. Some good prospects have been obtained in this lease from surface veins, but owing to its patchy nature, and not being able to trace the gold to any depth, work is suspended for the present. 19 tons of quartz crushed from all sources giving 23 ozs. 1 dwt. of gold.

Next comes the Caledonian line of reef, all of which is held and leased by Sydney gentlemen. No labour has been employed on this line of reef during the year.

Further south, and a half-mile from Surface Hill, is situated Grice and party's lease, on Big Oakey Creek; 87 tons of quartz raised, yielding 64 ozs. 4 dwts. of gold. The vein in this mine, as in all others in the locality, patchy, about half of the quartz being picked and thrown away, the remainder yielding an average of about 15 dwts. per ton.

Higher up the hill, and still south, on the same line of reef, is Campbell and Butche's 2-acre lease, from which 87 ozs. of gold was crushed from about 53 tons of quartz. The result of last crushing not being satisfactory, they are now trying other veins.

From Rampa's lease, on the same line of reef, 4 tons crushed from small surface veins yielded 3 ozs. of gold. Being considered unsatisfactory, the owner abandoned his holding as unworthy of a further trial.

O.K. Mine and Vassilla's Lease.—A few tributors raised 12 tons from this mine, with a result of 5 ozs. 12 dwts. 10 grs., but not considered payable. Mini and Vassilla's claim, adjoining the O.K., has kept its reputation throughout the year. Splendid results obtained from every crushing. From 43¼ tons crushed, 189 ozs. 4 dwts. gold was obtained; 17 tons of rubble, yielding 38 ozs. 12 dwts. 8 grs. Total for the year, 227 ozs. 16 dwts. 8 grs gold.

No. 1 North, Williamson Bros.—Two men's ground. Good payable gold stone has also been raised from this claim. Some difficulty had to be contended with here, owing to the hardness of the rock and narrow limit of width of the veins. Last crushing from these veins yielded 67 ozs. 10 dwts. from 12 tons of quartz. From 29 tons of quartz and 12 tons of rubble, 193 ozs. 3 dwts. 10 grs. of gold was obtained.

No. 2 North, Frenchman and Party's.—This claim had been held in the early part of the year by another party, who raised two small crushings, 16 tons crushed realizing 20 ozs. 10 dwts. of gold—the last 12 tons crushed giving only 14 dwts. per ton, it was abandoned. When the present occupiers took possession, their first crushing, 12 tons, yielded 17 ozs., being considered payable, and the vein showing gold freely. Considerable expense was incurred in sinking shafts, erecting whip, cutting road, &c. Subsequent crushings have been raised, the last of which did not prove payable—14 dwts. per ton—58 tons crushed yielding 62 ozs. of gold. Total amount of gold from this claim,—82 ozs. 10 dwts.

Mitchell Bros. have raised 6 tons on the same vein, from which 8 ozs. 10 dwts of gold was obtained.

Box Ridge.—During the past year a couple of small crushings have been raised from the Homeward Bound Reef, above the water-level, the former yielding a little over an ounce, the latter 1 oz. 14 dwts to the ton. As the vein is small, neither of these lots paid wages.

No attempt has been made to test the reef at a greater depth, as the influx of water would render it too expensive on individual enterprise.

Shakespeare Reef.—From this line a small lot of about 50 tons has been put through the mill, for a yield of 16 dwts. to the ton. This return would pay good wages, seeing that the country traversed, by the vein is of a soft nature, requiring but little powder. A fresh shaft requires sinking, but I have been given to understand that the tributers failed to come to a satisfactory arrangement with the lessee of the ground respecting it, and accordingly it has lain idle for some months.

Han's Reef.—The prospectors on this line have been obliged to discontinue operations on account of the quantity of water met with at the greatest depth attained —about 90 feet. They had a small crushing, which, although not equal to that which they obtained in October last year, was still fairly payable stone. As this ground will be very expensive to work, owing to the amount of water to contend with, and the quantity of timber required to secure the ground, it is doubtful if it will ever be opened up again, unless capital is invested in it.

Britannia.—There is one party at work on this line, and getting fairly payable stone. This reef—a flat one—was opened about thirteen years ago, and some exceedingly rich stone obtained. The vein at present being prospected is a vertical one. It would be premature to give any decided opinion respecting it, but those at work on it seem to be very sanguine of success. In alluvial mining there is nothing doing. I have heard of one or two claims on the river paying wages.

At Back Creek, Crudine, a new reef has been discovered by Elkin & Co., which shows gold freely. The prospectors have about 8 tons of quartz now ready for the mill.

Eight gold leases and one mineral lease have been applied for during the year.

The following miners' rights and business licenses have been issued by me :—Miners' rights, 449; business licenses, 21. And the gold sent by escort amounts to 4,952 ozs. 3 dwts. 6 grs; by other means 1,072, ozs., 10 dwts. 22 grs., which averaged in value £3 15s. per ounce.

Enclosed herewith are all returns of machinery, &c., which I have been able to obtain in the division.

TAMBAROORA AND TURON DISTRICT—IRONBARKS DIVISION.

(*M. Hanley, Mining Registrar.*)

I AM unable to report that much progress has been made in mining operations during the past year, owing chiefly, if not entirely, to the number of men that (for the present) have left off mining and taken employment on the railway works that are being carried on through Ironbarks and Stony Creek.

The quantity of gold won during the year was 2,637 ozs., which is a trifle less than the quantity accounted for the previous year. I know that quantities of gold from this division have been disposed of during the year at the Banks at Wellington, which, if the correctly ascertained weights were known, might leave the amount won for the present year about the same as the previous one.

In July last a new discovery of gold was made in a basalt hill at Mookerawa. After washing 400 buckets of wash-dirt for 28 ozs. of gold, the prospectors sold out to four other gold-miners, who have not yet had a washing, but they have about 100 loads at grass waiting for water. The lead is 40 feet wide in this claim, and the prospects are considered good. The adjoining claim on the south has had a washing of twenty-four loads for 21 ozs. of gold. A number of claims were taken up, all of which had to be worked by tunnels. After spending months of hard work, and driving tunnels hundreds of feet, it was found out that they were all on a wrong level, and the miners had in every claim to commence fresh tunnels at lower levels. After spending additional weeks' labour in the new tunnels the majority gave up their claims without ever finding the lead. Since then claim No. 2 North found the lead, about 40 feet wide, in their claim, with payable prospects. These prospects have caused a revival of interest in the abandoned claims, many of which have already been taken up.

There has been no improvement in quartz-mining during the year. The tributers on Korff's lease, Poor Man's Reef, have a shaft down 90 feet, with a reef from 6 to 10 feet thick. During the past year they crushed 958 tons of quartz for 337 ozs. 11 dwts.; they consider they have not been well paid for their labour.

On the Trickett Reef there has been a large amount of prospecting done; in fact very little stone has been crushed, the claimholders being occupied in further prospecting, and the various shafts being very wet has made the progress very slow. From the original prospecting shaft on this reef something like 80 tons have been crushed for 11 dwts. per ton. Marshall and party have struck the reef in the adjoining claim, and are now engaged breaking payable stone.

Not one of the numerous forms which have been distributed throughout the division have been returned filled up. The only information given me is that of a memorandum from each of the quartz-crushers as the total result respectively of their operations during the past year.

Mr. William Scott crushed 1,287 tons of quartz from various reefs for 734 ozs. 6 dwts. This battery is of twelve head of stampers, is 10 horse-power, and valued at £600.

Mr. J. P. Allen, of the "Alarm" battery, at Stony Creek, crushed 420 tons of quartz for 201 ozs. 17 dwts. Some of this stone gave 4 ozs. per ton, but a great quantity of it gave only 5 dwts. per ton. The battery is of 30 horse-power, has ten stampers, and is of £1,000 value. Mr. Allen has only been a few months in charge of this battery. For the most part of the year he had charge of the battery at Muckerawa, where he crushed 620 tons of quartz and cement for 165 ozs. 11 dwts. This battery is now idle, and will not again resume work; it is valued at £800.

Mr. Henry Boehme, of Ironbarks, crushed 1,506 tons of quartz and tailings for 338 ozs. 12 dwts. This battery is of 15 horse-power, fifteen stampers, and valued at £1,000.

A party of thirteen Chinamen have a claim on private land on the west bank of the Macquarie River, near the head station of the Hon. F. B. Suttor. The claim is worked by stripping 15 feet of the river bank—which is old workings, and sluicing the bottom drift, which is about 4 feet deep. The water is raised from the river to a height of 40 feet by means of a large water-wheel. Fifteen weeks were lost during the year repairing damages by river flood, and the quantity of gold won during the remaining thirty-seven weeks was 130 ozs. The party pay £36 per year to Mr. Schous, the owner of the land. There is another large party of Chinese working the bed of the river by means of water-wheels, but they are located near Triamble, which I think is in the Hill End Division. I do not know what success they have had. Messrs. Marning, Calder, and Beattie are about following the example of the much-abused Chinaman, by erecting a water-wheel at their claim at their Muckerawa junction. They have hitherto been only able to work a few months in each year, when their race carried water from the Muckerawa Creek; they have been content with this sort of mining for the last ten years.

One party has been prospecting for copper for the last twelve months. He has not yet been successful in finding the lode, but he has good prospects.

During the year I issued 243 miners' rights, 28 business licenses, and 1 mineral license.

MUDGEE DISTRICT—GULGONG DIVISION.

(*H. De Boos, Mining Registrar.*)

MINING has not improved in this district during 1878. Prospecting has been at a standstill, in consequence of the want of water for the greater part of the year, and many of the old miners have left the district.

Want of capital has prevented the proper testing of the deep wet ground; but it is to be hoped that the companies at work, and others about to commence operations, under the regulations for aid from the Prospecting Vote, may be successfully carried out.

In April last Nolan and party reported the discovery of payable gold at Cooyal Creek, but after two or three months' unsuccessful work they abandoned their claim.

Payable gold was also reported last May in Rouse's paddock, at Guntawang, and a number of men have since been at work there, but I have not heard of any one making more than bare wages—from 7 to 8 dwts. being the most obtained from any one washing.

The discovery by Campbell and party in August last of a rich quartz leader in their claim on the Surface Hill, at the head of Happy Valley, created some excitement at the time. The first few dishes washed yielded as much as 15 or 16 ozs. to the dish in fine gold and specimens. Many claims were marked off in the vicinity; but in none of them has anything beyond the colour of gold been found.

The Red, White, and Blue, at Home Rule, is still being worked, and I believe with very fair results.

The proposed works at the Davie Buchanan, by the aid of the Prospecting Vote, is likely to prove beneficial to this locality by finding employment for a number of miners.

The Escort has taken from Gulgong during the year, 6,488 ozs. 9 dwts. 23 grs.

During the year 455 miners' rights and 53 business licenses have been issued from this office.

MUDGEE DISTRICT—MUDGEE DIVISION.

(*Francis S. Isaacs, Mining Registrar.*)

I HAVE the honor to report, for the information of the Honorable the Secretary for Mines, that mining operations within my division of the Mudgee Mining District are very stagnant, and show no improvement upon last year. There is however no lack of prospecting—several claims have been applied for during the year with every prospect of success; but none on Government ground have yet declared payable gold, although in nearly every instance gold has been won.

The principal alluvial digging is confined to private paddocks, where shares are all taken up; the miners seem to consider the inducements greater, and they run no risk of losing their claims by non-working. The rent per man is £1 per month, and claims are not worked until gold is declared payable in prospecting claim, the rent been considered cheap shepherding.

The principal of these paddocks are—"The Log Paddock," which has been a good gold-producing diggings for some years, and is far from being worked out. "Barton's" pipeclay produced payable gold three months back, which has caused other paddocks and adjoining lands to be worked, with what success has yet to be ascertained. "Pauling's" Apple-tree Flat: This paddock adjoins the Apple-tree Flat Gold-field, and I understand payable gold has been won through the year, and at different times nuggets have been found of large size.

There are a few European and Chinese miners fossicking and ground sluicing on portions of the Meroo River, but independently of these and those on private property, there are no works at present going on.

I cannot close this report without mentioning that a strong conviction exists amongst the oldest and most experienced miners (and others) here that a rich gold-field will be found in the Mudgee District. I hope by this time next year to be able to report this as a reality.

No tin, copper, iron, or other minerals are being raised, the digging being solely confined to alluvial digging.

The number of miners' rights issued during 1878 was 159, and 5 business licenses.

MUDGEE DISTRICT—HARGRAVES DIVISION.

(*Thomas O'Brien, Mining Registrar.*)

I HAVE the honor to report, with reference to mining matters in this division of the Mudgee Mining District: The alluvial mining in this division is principally fossicking in ground which has been worked some years ago, and this working was only carried on for a few months during the wet season. The amount of gold which passed through my hands to the Mint, as gold receiver, during 1878 was 1,466 ozs. 12 dwts. and 8 grs., against 2,166 ozs. 9 dwts. and 20 grs. for the year 1877, showing a decrease of 699 ozs. 17 dwts. and 12 grs., in 1878 compared with 1877. Notwithstanding this decrease in the gold passing through this office to the Mint, from inquiries made by me at various times during the past year, I have no hesitation in saying that there was far more gold won from this field in 1878 than there was in 1877, as I have been credibly informed that there was over 3,000 ozs. of gold sold to the Banks at Mudgee and elsewhere from this division during the past year. The principal part of this gold was obtained during the winter months by means of ground sluicing. The quartz-mining in this locality is next to nothing, there being only two men actually at work at reefing, and that for only a few weeks during the last year. They obtained some very fine specimens from a vein on the old Eureka line of quartz reef, in the town of Hargraves. As soon as it became known that those men, Bond and Corioles, struck on gold the claim was at once thrown into litigation, and so impeded the working of it to a great extent until very lately. These men have now about 20 tons of stone to grass, but they don't expect to be able to get any of it crushed for the next five or six months, so that they cannot give any authentic information about it at present.

I sold 374 miners' rights during1878, and 39 business licenses during the same year, being 170 more than was sold in 1877.

MUDGEE DISTRICT—WELLINGTON DIVISION.

(*Fred. Marsh, Mining Registrar.*)

BEING now in possession of the information afforded by the accompanying returns, it devolves upon me to make my report for the past year (1878) on the state of the gold-fields in this district under my charge.

Previous to my report for 1877, the severe drought which the country was suffering from had paralysed to a very considerable extent the mining industry of this district, and although at the time of making it I was sanguine enough to think that more favourable seasons were once more about to set in, I regret now to add that, notwithstanding heavy rains fell in the early spring, the summer as yet has been very dry. Alluvial mining, therefore, under such adverse circumstances, might have been expected to have received a serious check; but it affords me very great pleasure to state that the quantity of gold won from this source and by sluicing, &c., was considerably more than double the quantity obtained in 1877, viz., 1,675 ozs. 8 dwts. 4 grs., as against 789 ozs. 19 dwts. 9 grs. in 1877. This, I think, cannot but be considered as a favourable indication of the richness of the alluvial workings of this district: and should seasons similar to those which preceded the drought once more recur, I feel confident that the result would be a very large increase in the quantity of gold that would be obtained, and consequently a more certain and steady employment to an increased number of miners.

This alluvial gold has come more particularly from the different portions of the district already named in my last report, viz., Black Mountain, Jaw-bone, Bonada Creek, Woolamin, Euingala, Gunner's Dam, &c., and is the product of Chinese as well as European labour.

Turning to the results obtained by the use of quartz-crushing machinery, this report will not appear to contrast favourably with my last one. The gold under this head has, however, been obtained wholly and solely from one Company—that formerly known as the Mitchell's Creek Gold-mining Co., but now in private hands—the product being 1,422 ozs. 16 dwts., as against 2,388 ozs., the gross amount obtained in 1877 from this source; therefore there was a deficiency last year of 965 ozs. 4 dwts. But when I explain that through some unfortunate difficulty which stands as an impediment in the way of the working of the other Company's ground—no work whatever having been done during the whole of 1878—it will be easily perceived that the *proportionate* yield of gold from this source has not only not decreased but has increased considerably, for had the latter company—the "Kaiser"—worked during last year, it is only fair to assume that as much gold would have been obtained as was got from the Mitchell's Creek mine. Had such been the case, the result of 1877 would have been exceeded by that of 1878 by several hundred ounces. It is a pity that such a really splendid quartz crushing plant should lie idle; but I am informed that very shortly all difficulties are expected to be surmounted and work resumed.

I now proceed to show the amount of gold from all sources transmitted from Wellington by Gold Escort during 1878, viz.:—

	ozs.	dwts.	grs.
For March quarter	362	2	6
For June quarter	1,497	2	10
For September quarter	261	8	0
For December quarter	977	11	12
Total	3,098	4	4

Now, comparing this quantity with that obtained in 1877, viz., 3,127 ozs. 19 dwts. 9 grs., the insignificant deficiency in 1878 was only 29 ozs. 15 dwts. 5 grs., and had the Kaiser Company, as I have already stated, worked during the past year, probably 1,500 ozs. or 2,000 ozs. would have represented the increase over that of 1877—a loss to be deplored.

Under all circumstances, therefore, mining prospects are undoubtedly in an improving state, and would with a decided change for the better as regards the seasons, flourish to an extent that would compare favourably with any other district.

No new metals have been discovered, nor any nuggets requiring special mention been found.

I record my best thanks to all those gentlemen who have so kindly and without hesitation furnished me with the necessary information to compile my report.

MUDGEE DISTRICT—WINDEYER DIVISION.

(*T. H. Price, Mining Registrar.*)

I DO myself the honor to inform you that, in consequence of my recent appointment as Mining Registrar, I am unable to furnish a proper Annual Report for last year. This division was separated from the Hargraves Division, and I have no doubt the Hargraves Mining Registrar has included this division in his Annual Report, as, with exception of one business license and four miners' rights, which I issued at the end of last year, the Hargraves Mining Registrar issued all the other licenses. For the first three months of this year I have issued 145 miners' rights and twenty-two business licenses. This division embraces a large area, containing a scattered population of gold-miners, working on the Upper Meroo, Campbell's Creek, Stony Creek, Long Creek, Mudgee Gully, Queen's Pinch, Pyramul, Clarke's Creek, The Bogie, &c. With the exception of some new ground opened some months ago at the head of Campbell's Creek, and which carries now only about fifteen miners, all the rest of this gold-field the workings are mostly in or adjacent to old ground. There are many sluicing parties (Chinese) working when water is available. From what limited knowledge I have been enabled to obtain, and from my own experience of some years as a gold-miner in this district, I have reason to believe that according to the population a fair quantity of gold is being won, with an occasional good patch.

The quartz reefs, of which there are a great many opened, and some of the stone found to be impregnated with gold, are with two exceptions abandoned. The two claims working are at Clarke's Creek, both tunnelling, but neither have struck the vein they are seeking for. One of the claims, named the Crystal Palace, the result of which is anxiously looked forward to, as in the event of their striking payable stone a great impetus will be given to quartz reefing in that locality.

At the end of the year I shall be in a position to render a full description of gold-mining in my division, and I will then endeavour to give an exhaustive account of mining matters coming under my charge.

LACHLAN DISTRICT—FORBES DIVISION.

(*F. S. Osborne, Mining Registrar.*)

OWING to the continuance of the drought at the commencement of the year mining matters did not improve in this division, but during the last six months a decided improvement has taken place, caused by the South Lead Gold-mining Company, managed by Mr. Phillip Davies, a manager of known experience, having leased some 50 acres for gold-mining purposes on the once famous South Lead, near Forbes, and should they strike payable gold, which there is every prospect of their doing, will cause all the old leads to be again worked, and a large increase to our mining population. Already several leases have been applied for, and others in course of application. There are also parties of miners about to proceed prospecting, aided by the Government vote of £5,000, in various parts of my division.

I will now proceed to furnish you with particulars respecting the various claims in this division.

Alluvial Mining.

The South Lead Gold-mining Company's Lease is situated on the south bank of the river Lachlan, close to the town of Forbes. Work was commenced by this company the latter end of August last, since which time they have made good progress. The shaft is now down 230 feet in depth, or 10 feet below the bottom of the gutter. It is to be continued a further depth of 20 feet, so as to have the main levels 30 feet below the deepest part of the auriferous wash, in order to secure sound strata in solid slate for the main levels, likewise to facilitate drainage and ventilation. The company have likewise erected a substantial winding engine, 20 horse-power, and it was found of ample strength to cope with the water making in the mine, which is at present producing about 450 gallons per hour. The company are at present commencing to erect another 20 horse-power engine, which will be employed in driving two iron puddling machines, and pumping the water from the mine. It is confidently expected that by the aid of this powerful and complete plant that the company will be enabled to raise a large quantity of payable wash-dirt as soon as the main levels are sufficiently advanced to enable the manager to commence blocking out in a systematic manner.

The general prospects of this company appear to be highly favourable. The well-known quality and extent of wash-dirt on the South Lead will most assuredly establish or re-establish the former reputation of the Lachlan Gold-field, especially when this company are so well provided with machinery and capital to prospect their extensive property on this once celebrated rich lead.

Mathieson's Lead, Bald Hills, near Forbes.—This lead has been worked a great part of the year by Edmund Hey and others, who hold an extended amalgamated claim. They have sunk a fresh shaft, and have raised about 480 loads of wash-dirt, which averaged 14 dwts. to the load. The depth of their shaft is 210 feet, width of wash-dirt 20 feet, bearing nearly north and south. They are greatly troubled with water. This mine is worked by a whim, and they have a puddling machine on the claim, so that the wash-dirt is puddled as it is raised from the mine.

This mine would be very valuable if the owner procured steam machinery, as horse-power is not sufficient to drain the mine of the immense amount of water which flows into it; nearly half the day is lost in bailing, and some days they are only able to raise some two or three loads of wash-dirt. This claim is now held in reserve, so as to enable them to procure machinery. I have heard of several offers having been made to them to buy them out, and to float the mine into a company. Some of the dirt has gone as high as one ounce to the load; and I am sure if the mine was in better hands it would pay really good dividends, as all the dirt could be puddled on the ground, thus doing away with the expense of carting, &c.

Victoria Lead.—On this lead a great deal of heavy work has been done, but I am sorry to say with little success; they had about 30 feet of drift to go through, and were obliged to box the shaft that depth, which cost them great trouble and expense. After getting through the drift they commenced puddling back, but by some mismanagement they dry-puddled by shovelling the surplus clay behind the boxes, which caused the bottom box to bulge and the water to rush in, completely filling the shaft, they not having sunk the bottom box a sufficient depth into the clay before commencing puddling back; not being able to overcome the water, they were obliged to stop working in order to repair damages. The Warden allowed them to register the claim for three months to enable them to see what could be done. They then applied to the Department of Mines for a diving-dress, so as to enable them to repair damages. Since then the flood has completely destroyed the surface of their shaft, and washed the timber and logs away. The party have since become disorganized, but are now endeavouring to form another party to work the ground.

Rise and Shine Lead.—Nothing has been done on this lead during the year, although one party have been surfacing, but as yet have obtained nothing payable. This ground has been applied for by Rayner and others, to prospect, assisted by aid from the Government vote of £5,000.

Pinnacle Lead.—One party are working on this lead; they have bottomed two shafts, and are now sinking their third, as yet without payable results.

A party of miners are also about to prospect between Strickland's Reef and Forbes, assisted by the storekeeper in this town. This concludes all the alluvial mining now being carried on in my division.

Quartz-mining.

Foster's Reef Gold-mining Company, at Cudgellico Lake.—This mine has been worked up to August last; they have raised 1,099 tons of quartz; gold won from same, 376 ozs. 17 dwts.; value, £1,423 10s.; depth of shaft is 195 feet; deepest level, 185 feet; width of lode, 3 feet to 6 feet; dip, 1 inch in 10 feet, bearing north-east. Since August last they have suspended operations, but have since applied for a gold-mining lease of 13 acres, and, I believe, will shortly again resume work.

Strickland's Reef.—The shareholders of this mine have done no work during the year, having applied for a lease of their ground, which lease has not yet been issued. Would respectfully suggest that this lease should be issued as speedily as possible, as the reef is well known to be a payable one, and would be worked by others if the ground were available.

Old Mathieson's Lead.—Mr. Callow, who has a quartz-crushing machine on this lead, has crushed about 1,000 tons of surface quartz and cement from this lead during the year, and won 66 ozs. of gold from same, which, although a very small return, pays him for his trouble, as he also employs his machine in sawing and planing timber for the public.

All the reefs in my division are at present idle.

There are no metals or minerals other than gold in my division to report on.

Fifteen gold-mining leases have been applied for. 175 miners' rights and 58 business licenses have been issued during the year.

LACHLAN DISTRICT—PARKES DIVISION.

(*W. Clifton Weston, Mining Registrar.*)

IN forwarding you my annual report for 1878 for this portion of the Billabong Gold-field, I feel that my recent arrival and the very few opportunities I have had of examining the various leads places me in a disadvantageous position, and may militate against a favourable report. This is to be regretted, for from what I have seen of the district and what I can gather from previous reports of my superior officer, Mr. Warden Dalton, I am convinced that there is still an abundance of the precious metal still unearthed; and I have no doubt that in the course of a few months, or may be weeks, a lead will be discovered that will remind us of the palmy days of this once thriving place.

During the past few months two parties have been at work in Woods's Paddock to endeavour to find the lost Bushman's Lead. It is rather strange that this lead should run down to the creek and then suddenly disappear. I am inclined to think, as Mr. Wilkinson, the Government Geological Surveyor, pointed out when last here, that it will be found much lower down the creek, and that the Bushman's is but a small tributary to a much larger and richer lead. One party is still at work in Woods's Paddock.

I have nothing fresh to communicate about the No Mistake, M'Guiggan's, or the Tichbourne. On the Welcome several puddling machines were swept away by the floods in November last. Mr. Bray had two, and Everitt three; Pascoe and party also had one washed away, but they have put up another and repaired the old one. O'Donnel, at M'Guiggan's, had part of his swept away. He informs me that this once busy place is now quite deserted, with the exception of a few who have small patches of land cultivated.

At Reid's Gully several parties are at work, and others shepherding, Gilbert Grant's party having struck some good ground, which goes 12 dwts. to the load, and there is a fair breadth of wash-dirt. I had the information from Grant himself, so it can be relied on; but how long it will continue as good this deponent sayeth not.

On my first arrival here I was much struck with the appearance of the country, it reminding me very much of old Forest Creek in Victoria, or rather as it was in 1852; I do not know whether others have observed this likeness.

The country round about Parkes besides being auriferous is admirably adapted for the growth of cereals, and this year there cannot be much less then 50,000 bushels of wheat gathered, besides hundreds of tons of hay. So with these two pursuits, gold-mining and farming, we may reasonably look forward to more prosperous times. The terrible drought through which we have just passed, drove hundreds of diggers away from this district. These would, however, return if a good lead was discovered.

In quartz-mining, the Bonnie Dundee Reef, in the town, still continues to show good stone; the average is about an ounce to the ton. The stone is easily got, and cartage to the crushing plant not high. The owners speak hopefully of their prospects, and as they are steady, industrious men, success is nearly certain. During the past twelve months they have raised 444 tons of stone, which yielded them 450 ounces of gold, valued at £1,575.

Why more reefs are not worked I cannot understand, as there must be rich quartz veins in the vicinity.

During the past year two disastrous fires have devastated the town, thus entailing very considerable loss upon several of the inhabitants, besides casting a sort of "damper" on the community. Were it not for the loss sustained, one would almost be glad to see the old style of buildings cleared away by such means, as calico, bark, and thin boards, the usual materials used at a new gold-fields rush, are not very durable, and after a year or two anything but ornamental.

The number of miners' rights issued at the Parkes office during the year was 250, and about 120 at M'Guiggan's Lead. They are now all issued from the head office in Parkes, and diggers tell me it is more convenient to have a central office like this, where they can always make sure of having their wants attended to. 39 business licenses were also issued in 1878, and the quantity of gold bought by the Commercial Bank in 1878 was in ounces 2,451 15 dwts. 2 grs.; by the Australian Joint Stock Bank, 2,059 ozs. 11 dwts. 19 grs.; total 4,511 ozs. 17 dwts. 7 grs. This of course does not nearly represent all the gold won, as the Chinese storekeepers purchase largely, as also other business people. I have no means of ascertaining the exact quantity obtained this year, but no doubt Mr. Warden Dalton will supply that information.

It is much to be regretted that none of the miners would try the boring machine. If the prospecting party sent out by the townspeople had taken it and tried for the lost Bushman Lead some good might have been done. How to account for such supineness on the part of the diggers, I am at a loss.

I hope to have some good news to report soon about a copper mine situate about 12 miles north-west of Parkes, and belonging to Power and party. I have seen some specimens from this mine showing blue and green carbonates, apparently very rich. A ¼-share was sold to Mr. Ward, storekeeper, of this town, and the Company purpose erecting machinery and commencing work as soon as they can. Should this turn out well, it will give an immense impetus to business, and will be the means of other mines being worked, for there appears no limit to cupriferous land.

In conclusion, I may observe we are about *in statu quo multhum*, not much worse or any better; but I think we may fairly look forward in the present year to a renewal of our prosperity, with good seasons, abundant harvests, cheap food, recovered lost leads, and I hope a rush of diggers. These are elements, I think, that will conduce to render us happy and prosperous.

LACHLAN DISTRICT—CARGO DIVISION.

(*R. Hutton, Mining Registrar.*)

I AM sorry I cannot report so favourably of the mining in this division as formerly; in fact, during the last three years there has been a gradual decline both as to the number of men employed and also in the results.

In the alluvial on Gum Flat two of the claims on the perpendicular veins have been constantly at work during the year; these claims are Odger's and party and Hicks and party.

In my report for the year 1877 an error occurred as to the depth of Odger's and party shaft. The depth stated was 345 feet; it should have been 245 feet. During the year, however, they have sunk an additional 95 feet, making in all 340 feet, at which depth the vein was not considered payable. They are now working on a higher level.

In Hicks's claim, at about 200 feet, they had a hard limestone rock on one side of the vein, in which there were several fissures, through which a current of air was continually passing. These fissures no doubt are connected with some underground cavern, into which the miners may at any time break through.

Besides these claims three other parties have been at work on the 60-feet flat bottom, and have earned small wages.

About 3,200 loads of wash-dirt have been raised from those claims during the year, and about 730 ounces of gold obtained.

There has been no other alluvial mining done in the division during the year. About twenty-eight men have been employed.

The miners here are very sanguine as to the result of the prospecting shaft about to be sunk to test the main bottom of Gum Flat. It is strange, considering the indications, that this deep channel has not been proved before now, but the fact is, the ground is of such an extraordinary depth as to place it beyond the reach of the capital of the miner. It is to be hoped that the assistance promised from the Prospecting Vote may be made available as soon as possible, so that the work may be commenced without further delay.

In reefing there have been only three leases at work during the year. They are as follows:—Ironclad Gold-mining Company, Ironclad Reef; Mathieson and party, Ironclad Reef; Elder and party, Victim Reef.

The Ironclad Company refuse to make known the result of their operations during the year, but in fact they have done very little crushing. During the month of January they were occupied sinking their second shaft an additional 50 feet, and no stoping was being done, after which they found that the boiler at the battery was very much damaged, and had to undergo considerable repairs. The damage was caused by using the same water for both battery and boiler; this water had been used so often, and so much chemicals got mixed with it in the treatment of the pyrites, that it eat into the boiler plates to such an extent that a new plate had to be put round on the inside at the water-level. They have now made arrangements to have the boiler supplied from a separate dam. Another cause of delay was a change in the management. Mr. D. A. Brown is now general manager, and Mr. J. Hamilton is mining manager; and it is the general impression here that they are the right men in the right place. Mr. Brown has been during the last eight months treating the pyrites for the Company, and I am credibly informed with grand results. I am sorry Mr. Brown would not give me a statement of the actual results; but he informed me that the cost of treatment was just 20 per cent. of the proceeds, thus leaving 80 per cent. clear profit. This is certainly an extraordinary result, as the stuff operated upon had been previously roasted and put twice through the Wheeler's pans, and was considered valueless. I consider the sooner Mr. Brown's process is made public the better for gold-mining in general, as it is a well-known fact that there are hundreds of reefs in the Colony full of pyrites which carry a great quantity of gold, but the cost of extracting it, according to any formerly known process, would be more than the gold is worth, and many of these reefs now considered valueless will, under Mr. Brown's system, return handsome dividends. It seems he has fully mastered the difficulty of cost in extraction. Mr. Brown has lately purchased two interests in the Company, and has taken the management. He is now about to erect another large furnace, and intends to treat all the tailings that have been accumulating ever since the Company commenced. Mr. J. Hamilton, the mining manager, is the person who first struck gold in this reef about ten years ago. He and his party worked the ground for four years previous to their selling out to the present company, and it appears that the experience he then gained of the ground he is now turning to good account, as the stone lately raised under his guidance is much better than they have had for a considerable time. The company is now in full swing, with eighteen men in the mine, and six at the battery and furnace. The prospects of the company are much better than they have been for two years past.

Mathieson and party, Ironclad Reef, have done a great deal of work in the ground. They have several small veins which carry a good quantity of gold, which they have been following so as to find where they junction, but have not yet succeeded. There is a great quantity of pyrites in these veins, so that ordinary crushing would not extract more than half the gold; they, therefore, have had none crushed for a considerable time.

Elder and party, Victim Reef, have lately had a crushing of 23 tons, which yielded 29 ozs. of gold, but as the pyrites, of which they have a large quantity, were not treated, they consider they lost fully one-half of the gold. It is the opinion of the miners here that this would be a good payable property if it were in the hands of a company with a little capital to spend upon it.

About twenty-four men have been employed in quartz-mining in this division during the year. There are, however, at the present time thirty-six.

There were forty-two miners' rights and seven business licenses issued during the year.

The quantity of gold won, as near as can be ascertained:—Quartz, 1,000 ounces; alluvial, 730 ounces: total, 1,730 ounces.

LACHLAN DISTRICT—GRENFELL DIVISION.

(*E. G. Brodie, Mining Registrar.*)

I HAVE the honor to forward my report relative to mining interests in this division for the year 1878.

Comparing the returns connected with this field for 1877 with those for 1878, I find there is a slight increase both as regards the quantity of gold won and number of miners employed in favour of the latter year. Having placed myself in communication with most of the leading miners of this district, I am enabled to furnish the following particulars, viz.:—

Starr Gully.—Quartz claim—Fitch and party—worked by two men. This claim has just been taken up; no stone yet raised.

Bolton's 2-acre Lease.—Two men working; depth of shaft, 100 feet; 17 tons of stone crushed during 1878, yielding 2 ozs. to the ton; worked by windlass and rope; party at present prospecting.

O'Brien's Hill.—Evans and party. Two men at work; depth of shaft, 40 feet; vein, 18 inches wide; yield, 4 dwts. to the ton; worked on tribute by windlass and rope.

Williams and party.—Three men working; depth of shaft, 30 feet; vein 18 inches wide; 200 tons crushed during 1878; yield, 8 dwts. to the ton; worked on tribute by windlass and rope.

Four other miners are also at work here. They have only just started.

Homeward Bound Hill.—Joseph Tippett's party.—Depth of shaft, 118 feet; worked by whim and horse; vein 10 to 15 inches wide; 277 tons crushed during 1878, for 8 dwts. to the ton. This claim was worked by four men last year. The party is now broken up.

Maher and party.—Two men at work surfacing; crushed 50 tons of stone during 1878; yield, 8 dwts to to the ton.

Main Lead—Victory Lease.—Allsop and party.—Depth of shaft, 125 feet; vein 9 to 12 inches wide; 289 tons of stone crushed in 1878, yielding 3 dwts to the ton; worked by windlass and rope.

Enterprise Reef.—Pettit and party.—Four men at work; vein 2 feet wide; 223 tons of stone crushe in 1878, yielding 363 ozs. 12 dwts; worked by whip and horse.

Britannia Reef.—Nelson and party.—Four men at work; depth of shaft, 180 feet; no defined reef; 25 tons of stone crushed during 1878; yield, 3 dwts. to the ton (not payable). Party at present prospecting.

Lucknow Hill.—Pritchard and party. Two men at work surfacing; no crushing done for 1878.

M'Kenny and party.—Two men at work; depth of shaft, 15 feet. This claim is just taken up; party at present prospecting.

Lawson's Hill.—Hinchcliffe and party.—Two men at work; depth of shaft, 20 feet; vein 9 inches wide; worked by windlass and rope. In this claim the reef has just been struck after twelve months' prospecting.

White Rose Reef.—Hall's party.—Four men at work; windlass and rope used; depth of shaft, 50 feet. No work was done on this claim during the first ten months of 1878. During the last two months the party has been prospecting.

Welcome Hill.—Warton and party.—Two men at work; depth of shaft, 15 feet; vein 9 to 12 inches wide; worked by windlass and rope. This claim is on a new reef. The party are raising stone for a trial.

One-mile Gully.—Alluvial claim—Slingfellow and party.—Two men at work; depth of shaft, 46 feet; worked by windlass and rope; just bottomed; at present prospecting.

Williams and party.—Two men at work; depth of shaft, 50 feet; worked by windlass and rope; just bottomed; party at present prospecting.

Main Lead.—O'Connor and party.—Three men at work; depth of shaft, 50 feet. This claim has been worked for the last six months; the wash-dirt, 70 loads, has not been washed.

Quandong Gully.—Dodd and party.—Three men at work; depth of shaft, 200 feet; worked by whip and horse; 130 loads of wash-dirt got during the year, averaged about 2 dwts. to the load; average depth of wash-dirt, 1 foot; puddling-machine used.

Seven-mile Gully.—Doyle and party—Three men at work; depth of shaft, 84 feet; depth of wash-dirt, from 6 inches to 3 feet; 100 loads washed during 1878; yield, 8 dwts. to the load; worked by windlass and rope.

Burke and party.—Two men at work; 100 feet sinking; depth of wash-dirt, from 6 to 18 inches; yield, 6 dwts. to the load; worked by windlass and rope; 200 loads washed in 1878.

Parker and party.—Depth of shaft, 84 feet; wash-dirt, 18 inches; 100 loads washed during 1878, yielding 5 dwts. to the load; worked by windlass and rope.

I have also the honor to report that a party has been prospecting for some time back at Tin-pot Gully, about 15 miles from here, but no payable gold has yet been found. No minerals other than gold are being at present worked in this district.

In conclusion, I would remark that a good many claims have recently been taken up by parties who have been engaged in bush-work during the greater part of 1878, and from what I can see most of them will make good wages during the coming winter.

Lachlan District—Young Division.

(J. R. Edwards, Mining Registrar.)

I have the honor to inform you that in drawing up a report for the year 1878, as to the working of the Young Division of the Lachlan Mining District, I might, without the omission of anything material, repeat every line of my report for 1877, except as to the yield of gold and issue of miners' rights and business licenses. No new ground has been struck—no new companies started; nor have additional races nor sluicing claims been registered. The same claims have been worked, the same ground operated upon, and the difference in the yield of gold between 1877 and 1878 is consequent on the increased rainfall during the latter year; and this result fulfils what I pointed out in my last year's report.

A good deal has been said and written upon the auriferous character of the land around the town of Young, but I am fully convinced, from the knowledge gained by many years' experience here, that the greater portion of the land marked as highly auriferous will never turn out to be remunerative, if worked by any of the ordinary appliances at present known. There are patches, which are all held as leases or registered tenements payably auriferous, and which could be made to yield a much larger return than they now do, if worked by proper machinery, instead of the primitive and slovenly mode employed at present; but to reserve large areas of land from alienation and settlement merely because old shafts abandoned by diggers perforate the surface, is, I think, injudicious. Some years back several allotments of land situated inside the town boundary were sold by auction at a Government land sale. This land was dotted all over with abandoned shafts. A large portion of the soil has since been worked to the bed-rock for brickmaking purposes, and although every ounce of the soil has been thus operated upon, and some of the workmen being experienced diggers, no trace of payable gold has been discovered; yet the adjoining land is marked "auriferous," and reserved for gold-mining purposes. There are capital and labour ready for investment and employment. The land has been available for years, and although several attempts have been made, by the employment of manual labour and the best mechanical appliances, no ground has been found payable beyond the few holdings I have mentioned as leases or registered claims. It seems to me, therefore, that land which will not yield payable gold should be made available for the spread of population and the furtherance of profitable industries. The land need not be alienated to mere speculators, who seize on all they can grasp by virtue of a few improvements and a miner's right, but could be submitted to public auction in small quantities, at stated periods, with an upset price sufficiently high to ensure a fair value being realized, and shut out any "arrangement" among the purchasers.

The gold purchased during the year 1878 from claims in the district amounted to 2,143 ozs. 13 dwt. 3 grs., valued at £8,145 17s. 10½d., the standard price during the whole year being £3 16s. per ounce. Gold to the amount of 455 ozs. 12 dwts. 11 grs. was also brought into the town during the same period from Grenfell, but this is not included. The increase on the previous year amounts to 1,324 ozs. 15 dwts. 21 grs. I have stated the cause of the increase, namely, the heavy rainfall.

The miners' rights issued during the year amounted to 314, value £136 5s.; business licenses, 23, value £17 10s. There is an increase of 61 miners' rights on the previous year's issue; and I account for this increase by the investigation that took place here as to the petition and counter-petition for and against a municipality, when many of the combatants armed themselves with a miner's right to prove their qualification to vote.

Some claims have been taken on the abandoned quartz reef known as the Marshall M'Mahon, Murrumburrah, but as some of the original holders have already disposed of a full fourth share for a few pounds, the prospects at present do not look very brilliant, although the present holders seem very sanguine of success.

Tonking and party are progressing steadily, but as Mr. Slee will have fully detailed everything in connection with this holding, I need not refer to it here.

SOUTHERN DISTRICT—BRAIDWOOD DIVISION.

(*W. F. Robertson, Mining Registrar.*)

IN submitting this report upon the state and progress of the mines in the Braidwood Division of the Southern Mining District during the year 1878, I have the honor to state that the remarkably small rainfall spoken of in my three previous annual reports, and which had been so very disastrous in its effects upon all mining operations in the division, did not in any degree increase during the year 1878, and that consequently the same inconvenience has been suffered from the insufficiency of water in the various creeks and other ordinary sources of water supply to work the numerous ground sluicing claims on the Shoalhaven River Gold-field and the Jembaicumbene Gold-field. But notwithstanding this very serious obstacle in the way of working the larger area of the auriferous ground in the division, there is still the most encouraging feature that I pointed out in my last report, namely, that the yield of gold from the various claims on and near to the banks of the Shoalhaven River continues steadily to increase year by year. This fact, I think, shows not only that great perseverance has been and is still being exercised by the miners, who have had to encounter such great difficulties from scarcity of water, but also that this field is very rich in the deposits of the precious metal. It is curious to see the tenacity with which some of the oldest and most experienced miners will hold to ground which to the casual observer has nothing particularly attractive in it, but in which these miners, as it were, instinctively see strong indications of the existence of rich gold deposits, and work most patiently and perseveringly with, as I believe, remarkably good results in most instances on the Shoalhaven River, thus showing that this is an undoubtedly rich field to the persevering, plodding miner. The gold too is of a superior quality, and always commands, by several shillings, a higher price than that gained from any other field in the Southern District, except perhaps one or two others.

The several larger claims which I spoke of in my last report as having ceased to be worked in consequence of the entire failure of the water supply from the larger creeks are still unworkable from the same cause; and the Shoalhaven River Sluicing Company's claim, which I alluded to as having formerly been worked by means of vastly expensive works for the raising, storing, and diverting of water from Reedy Creek and other sources, is still lying idle, though it has changed hands lately, and is now held by two practical and intelligent miners, who hope to make a good thing out of it in the end, which I have no doubt they will do if they thoroughly work their claim when opportunity occurs for so doing.

I believe the whole of the miners, both on the Shoalhaven River and at Jembaicumbene, are working on the co-operative system, and all appear fairly satisfied with their earnings, though it is difficult to ascertain what quantities of gold their claims yield individually. The aggregate amount from each field is all that can be ascertained, and that only approximately, from the Banks, who are nearly, though not quite, the only buyers of gold in the district.

At Jembaicumbene there have been some new finds on portions of the Church and School land, which were withdrawn from sale for that reason a few months ago; but there too is the old difficulty—there is not any water, and the wash-dirt is not sufficiently rich to pay for cartage to the water; but if water should at any future time be available, this land might be worked profitably. Some considerable amount of capital will, however, be required to bring the water to the ground, and the necessary capital is unfortunately not now forthcoming. Capitalists, it is to be regretted, have latterly refused to go into mining ventures of any kind in this division, and it is left only for the working miner to find the gold with the limited means at his disposal, and without the aid of machinery of any kind. This of course is the result of reaction caused by the rash speculations formerly indulged in, by which so many persons lost so very heavily on mining ventures.

SOUTHERN DISTRICT—ARALUEN DIVISION.

(*E. F. Carlile, Mining Registrar.*)

IN forwarding my returns for the year 1878, I have to report increased activity in mining matters in this division, which will be seen by the amount of gold won, the number of miners employed, and of miners' rights issued, all of which are in excess of the returns for the previous year. This result has occurred notwithstanding the material interference with mining operations caused by the serious and long-continued drought—the consequence of which is that nearly all the ground-sluicers have discontinued work, and registered their claims and races, and some have sought work in other places. All who are depending on surface water for washing are greatly inconvenienced; one large claim can only wash half the usual quantity of dirt, and others have to pump water from their drainage races to carry on the works.

The claims in deep ground have had varying success, occasionally getting good returns. One party, after working out a rich "patch" in old ground, has discontinued for a time, intending however to re-open shortly. Two others have been working with reduced strength for some weeks, waiting the arrival of steam-engine and winding machinery. Two blocks of ground, which have been unoccupied for a long period, have recently been taken up, and several men and horses are now employed thereon; but owing to the drawbacks with machinery, &c., incidental to opening a large claim, washing has not yet commenced; hopes are entertained, however, that in the course of three or four weeks the wash-dirt will be reached.

Some quartz-mining has been done at Bell's Creek, with an average return of 19¼ dwts. to the ton. A few tons of stone taken from the bed-rock were expected to have yielded very well, but owing to the presence of mundic the expectations were not realized, the result being only about an ounce. The stone was roasted previous to crushing, which by some was thought to be a mistake. The tailings are saved for future treatment.

The amount of gold won in the division for the year is 5,100 ozs., from alluvium, and 358 ozs. from quartz, being a total of 5,458 ozs., of the value of £20,345.

SOUTHERN DISTRICT—MAJOR'S CREEK DIVISION.

(*John Heazlett, Mining Registrar.*)

IN submitting my statistical report for the year 1877 I expressed an opinion that from present indications the year 1878 would show many signs of improvement in both quartz and alluvial mining within my division. I now find that my predictions have been a failure, therefore offer a few remarks as to the cause of the present depression.

1st. The Homeward Bound Co-operative Company, Spring Creek, numbering twenty-four working shareholders, and employing the same number of wages-men, were doing better than usual, and their prosperity was shared by many others, but, unfortunately, the claim did not pay during the first nine months of the past year, when a dissolution took place. There were, however, a few of the shareholders who believed that with a smaller party and better management the claim would give wages "at least," and after due consideration formed a new party of eight shareholders, who employ from eight to ten hands (occasionally), and have been going on for the past three months with varied success. Had this claim shaped as well during 1878 as it had done the few weeks ending December, 1877, it is quite probable that from fifty to sixty men would have been employed.

2nd. The Messrs. Wilson, Stuart, & Co., of the Temperance Star Machine, from some cause best known to themselves, made very little progress in opening their mundic reef on the eastern point of Big Hill, where the mundic was expected to yield 14 ozs. to the ton.

3rd. Messrs. Field & Co. have not employed much labour, being engaged crushing the stone already to grass, the pyrites from which were forwarded to Victoria for treatment. Had this company been fairly at work, as it is expected they soon will be, many men would have been employed.

4th. Mobbs' line of reef or leader, on Red Hill, gave little employment. The few claims on this line did not hold out, and one or two parties only have kept on.

5th, and lastly. The past year has been a dry one, hence no ground sluicing has been done on the Major's Creek, with the exception of a few weeks in February, at which time there were a few days constant rain, which gave about a fortnight's sluicing—so that it may be said that alluvial mining on the Major's Creek portion of my division during the past year has been a dead letter.

The foregoing remarks will show that I had reasonable grounds for the opinions I entertained when making out my report for 1877.

Having pointed out what has not been done, I shall make a few remarks as to what has been done during the past year, and what may be expected in future.

The Homeward Bound have made a fresh start, on the 6th instant, and if wages can be obtained will continue work.

Messrs. Wilson, Stuart, & Co. have sold their crushing plant, water-right, and claim to Messrs. Field & Co.

Messrs. Field & Co. having purchased the Temperance Star machinery, water-right, and claim from Wilson, Stuart, & Co., are now getting up stone for testing; have also sunk a shaft on the five-acre lease, with the view of proving the value of their ground before erecting furnace, &c. This company have 13 acres on Crown lands, and about the same area on private lands adjoining, the whole of which will be in full swing ere many months have elapsed—that is, should the stone being raised on private land prove payable. The stone from the eight-acre lease has been crushed here, and the pyrites sent to Victoria for treatment; and although I have not heard the results, am of opinion it proved satisfactory, otherwise the company would not have bought Wilson & Co.'s crushing plant.

I have samples from the reefs at work made up ready for dispatch, when I get the chance of a conveyance. They are ticketed, so that there will be no difficulty in ascertaining from whence they came.

Messrs. Dunshea Brothers finding their reef on Red Hill would not give them any return after carting and crushing at 13s. per ton, have erected a battery of ten stamps and steam-engine, and have been at work some three months, the results of which will be found in the accompanying forms.

At Long Flat there is very little change; indeed, I think the miners of this place have done as well in 1878 as they did in 1877. Of course the returns show different; but the information as to the number of tons puddled, and the yield of gold therefrom, is nothing more than conjecture—no books are kept; my only dependence is in the gold-buyers, but, unfortunately, one of those keeps no book.

The sum total of gold sold here in 1878 shows a decrease of about 114 ozs. as compared with that of the previous year. I am, however, under the impression that if facts could be reached the decrease would not reach 114 ozs., nor the half of it. In 1877 one buyer told me his purchases averaged about 5 ozs. per week, and in 1878 about 2½ ozs. per week, equal to one-half. I find that another buyer's purchases are as follows: for 1877, 1,646 ozs. 10 dwts.; and for 1878, 1,610 ozs., or 36 ozs. 10 dwts. less in 1878. Had the Homeward Bound—Messrs. Wilson and Co., and Messrs. Field & Co.—been raising and crushing during the past year, and it had been a wet season, a much larger quantity of gold would have been obtained.

A little more experience is required in the treatment of mundic, and also the means, and until both these are on the ground our reefs will not go ahead.

The decrease in the number of miners since my previous report is owing to the fact that in this report I have not included the Jembaicumbene Gold-field, it being outside the boundary line of the Elrington Gold-field reserve, I presume it is not within my division.

The number of miners' rights sold during the past three years shows a decrease of sixteen. In the year 1876 I sold ninety, in the year 1877, eighty-two, and in the year 1878, seventy-four rights. This falling away of the miners' rights, though small, is a bad sign of prosperity; and it being generally admitted that there can be no effect without a cause, I may as well point out what I conceive to be one great cause. For years past auriferous land has been taken up by free selection and otherwise, not only in the immediate vicinity of the diggings, but also on the outskirts; even at the present time people are told they will be allowed to purchase auriferous land at Long Flat, which they have fenced in and claimed as their own for the past sixteen years, or nearly so, and in the meantime closing up miners' water-rights, driving families to ruin, and this same land about the very best to be found on this field. It is well-known to the miners, and probably to the Government, that Berlang is auriferous, not only so, but was found to pay many years ago, and would now with a supply of water. It is also known that quartz reefs are to be found in the ranges overhanging the Araluen Valley, where, on top of one hill, termed the Sugarloaf, claims are now held and worked in rainy seasons; plenty of gold, if water to wash away the surface—no greater proof of reefs than this. Yet this land is being alienated from year to year. Next comes the pre-leases, right into the heart of the diggings, so that miners are told they cannot claim the grass upon their gold claims; hence, if they try to keep a few cows or a horse, it will take in some instances more than they earn to release their cattle from pound. Again, miners require timber for mining purposes as well as fuel; 'tis true any rubbish of wood may do for the latter, but not so for building and mining purposes. For these and many other reasons, the need of water, &c., the miners who are able to leave will not think of remaining on a gold-field where they are being driven to desperation, consequent on the alienation of the gold-field.

I have prospected a considerable area of ground, and having been gold-mining for the greater portion of twenty-six years, I think I ought to know what ground will pay when water is at hand, and have no hesitation in saying that if the water of the Shoalhaven River, and any other water which could be collected, was brought on this gold-field, it would give employment to a much larger population than we have at present. The miners say that if the Government would cause a survey to be made, or levels taken, from here to the Shoalhaven River, and if found to be impracticable, it would set their minds at rest; and if water can be brought for a reasonable amount of money, it would be only "lent," as by its sale and the extra miners' rights and duty on gold the outlay would soon be made good to the Government.

SOUTHERN DISTRICT—LITTLE RIVER DIVISION.

(*P. J. Galway, Mining Registrar.*)

I have the honor to enclose Annual Returns for 1878, and am not able to report any improvement in mining in this division for the past year, no rain sufficient to start the water-races having fallen—the past year being the fifth in succession of extraordinary dry seasons.

Numbers of miners have had to leave, and look for work elsewhere, whilst others who can afford it are stacking wash-dirt in the hope of the weather soon changing—piles of from five to fifteen thousand loads not being unfrequent.

The quartz reefs are still neglected, an application for a 7-acre block having fallen through by reason of the death of the applicant.

A new reef was reported, and though the prospectors obtained 25 ozs. of gold from specimens, after sinking 15 feet, and banking some 10 tons quartz, they now await a trial crushing of the stone before proceeding further.

I annex the following, as showing the dull state of mining matters here:—

Every practical miner who has visited Little River is of opinion that untold wealth lies hidden in that locality, waiting duly for proper means to be adopted for its development. From its earliest days the river was celebrated for its nuggets, and every now and then—even in these dull times, when there is little else than fossicking going on there—a digger stumbles over one, which clearly denotes the extraordinary richness of the locality.

A few years ago the reefs were busily opened on all sides, and the prospect of their proving highly remunerative which they held out gave promise of ushering in quite a new era in gold-mining in this district.

Rich stone was raised from the majority of the shafts that were put down, and two crushing machines were erected, and employed for months crushing with highly satisfactory results.

In some instances regular jeweller's shops were opened up—the precious metal was found thicker than the quartz to which it was attached.

No proper mode of operations was adopted, however. What little capital was introduced was either misapplied or squandered.

When at the depth of from 40 to 50 feet water became so troublesome that nothing but steam-power could contend with it. The end came, and the reefs, just as they were at their highest promise, had to be abandoned.

Thus the opened workings lie to this day—some of the shafts as they were left, some fallen in.

SOUTHERN DISTRICT—NERRIGUNDAH DIVISION.

(*W. J. Foster, Mining Registrar.*)

THE close of the year 1878 shows an increase of the miners in this division on the year 1877 of 51, or about 31 per cent. This addition is made up of Europeans attracted to the Dromedary Gold-field, and of Chinese returned to the Gulph Creek Gold-field from the farming districts, where they have been employed by the settlers in clearing land during several years past. That industry being on the decline, or not offering sufficient remuneration to induce them to continue in that work, they have resumed their old and first occupation upon arriving in the country, searching for gold, as their contracts have been completed, and others will follow as their undertakings are fulfilled.

Gulph Creek Gold-field.

On this field mining remains, at the close of the year, substantially the same as at the end of the year 1877. There have been no new discoveries, and there has been a slight exodus of the miners to Mount Dromedary.

In quartz-mining there is nothing to note. The tributer of the Bumbo Reefs commenced work there in January last, and continued it until about the 1st of April following, but with what success, or what prospects he had on ceasing work, I cannot state, as I have been unable to obtain any information as to the work done, prospects showing, or the amount of gold obtained.

The other reefs upon this field have been and are still idle, save the Prospector's claim on the Upper Gulph Creek, upon which about two months' work was done in the second quarter of the year; but with what results, or what were the prospects, I am unable to state, for the reason last above-mentioned.

Dromedary Gold-field.

On this field mining during the past year has assumed a more encouraging aspect than for many years previous. The news of the discovery of auriferous quartz on the north-east slope of Mount Dromedary attracted miners from other fields and from other Colonies to that locality in considerable numbers about the middle of the year, but most of them left again, some immediately after arrival, without trying the ground, and others after a few days' trial—the country not coming up to the ideal they had formed of the place, and to many of them doubtless presenting topographical features to which they were entirely unused, conduced to the opinion in their minds that there was no gold there, and that the reported discoveries were not true. A small party, more stout-hearted or more sanguine than the others, went to the south-west slope of the mountain, and commenced prospecting in Curia Creek for gold. Their efforts were crowned with success, and in about ten weeks they took out 286 ounces of gold, which I reported to the Department at the time. From that time down to about the end of November last there was on the ground on the average about twenty miners, meeting with varied success; some of them were well paid for their labour, and all were fortunate enough to make a good living. During that time a considerable number of miners from this and other Colonies visited the locality, but did not remain; very few of them, if any, tried the ground, the reasons stated above doubtless being the cause of their short stay.

Towards the end of November some very good finds were made, which, as the news spread, induced others, mostly from other parts of this division, to try their fortune on the new field, and at the close of the year the miners employed at that place had reached the number of fifty.

Since work was resumed there after the holidays fresh discoveries have been made, and, as I am informed, at the present writing there are about 100 miners on the ground, all being fairly remunerated for their labour, and some of them realizing £10 and upwards per week. This does not properly belong to this report, but I consider the information of sufficient importance to be noticed at this time.

The Curia Creek takes its rise nearly on the top of the mountain, and runs generally in a south-westerly course. From its source down the slope of the mountain numerous small creeks or gullies join it, both from the east and the west, and it and its tributary creeks or gullies are all gold-bearing so far as they have been prospected. Recent discoveries there tend to the opinion among the miners that there is a lead of gold of considerable extent, and more or less rich, extending along the south-western face of the mountain. That question will in all probability be solved in the course of a month or two, as there are now in the locality sufficient miners to test the ground in that time, considering that it is generally shallow—the deepest, so far as known, not exceeding 12 feet. The most serious obstacle to the miners' progress on that field are the granite boulders, of all sizes, from the small ones that one man can lift to the large ones the size of a small cottage, and containing 200 and more cubic yards, and impacted together so closely that it is difficult to get a face on the work or remove them at all. The miners have therefore to drive under them where practicable, which is a work attended with more or less danger; but some excellent finds of gold have been obtained under them.

In quartz-mining the progress made during the year has been in some aspects barren of results. A considerable area has been taken up under the Mining Act and Leasing Regulations, but no work has been done on it, and no gold won.

The leases have been issued, and two-thirds of them executed by the lessees, covering an area of 42 acres. No work has been done during the year on any of the ground under application for leases, except in application No. 3 for 6 acres, in which a tunnel has been driven about 130 feet, for the purpose of cutting the prospectors' (Messrs. Cowdroy) vein, at a depth of over 100 feet from the surface. At the end of their tunnel they struck so strong a flow of water that they were compelled to suspend the work for a time.

In the prospectors' ground they have sunk a shaft 63 feet on the vein, and driven a tunnel to cut the shaft at the bottom. They are now having a crushing plant, consisting of a battery of eight stampers, worked by a turbine wheel, erected upon their ground, which will be ready for work about the 1st of May next.

Two trials of 2 tons each, of stone taken from different levels in their shaft, have been made at the Royal Mint during the year, giving a yield of upwards of 2 ounces of gold and some silver per ton. The exact particulars I cannot state, as they have failed to supply me with the data, though promised some weeks ago.

In No. 2 West, an ordinary claim under the Mining Board Regulations, between 600 and 700 feet of tunnel has been driven altogether, the gold being extracted from the stuff by sluicing. Some very promising ground was reached towards the close of the year. No stoping has been done in any of the ground; in fact it was useless to do any, unless for prospecting purposes, as there was no way on the ground of extracting the gold except by sluicing, which process entailed a loss of a large percentage of gold.

Now that the leases covering the larger portion of the occupied ground have been executed, and the labour conditions attach, and the prospect of a crushing plant being in operation at an early day, there is great hope that during the year mining will assume greater activity there, with corresponding remunerative returns.

On the south-west slope of the mountain, on the Star of the South line of reef, which crosses the head of Curia Creek, on a course east and west, applications to lease 12 acres have been made, which will have to remain in abeyance until they are surveyed.

The prospectors have driven a tunnel in the prospecting claim a distance of 65 feet, and cut the vein at a depth of 30 feet from the surface. The vein where cut is 7 to 8 inches thick, and underlays about 12°; the walls are sedimentary granite, and the ground is very wet. The show of gold in the stone is excellent. The prospectors purpose having a ton of the stone tested at the Mint as soon as possible; the results will be published.

In the tables accompanying this report you will observe that I have kept the returns of gold won from the Dromedary and this field separate, for two reasons;—1st. To show the produce of each field. 2nd. The gold from the two fields has a large margin of difference in value—Dromedary gold being worth only about £3 11s. per ounce, while Nerrigundah gold is worth £3 18s. 6d. to £4 per ounce.

Looking generally at the prospects with which the year 1879 commences, there seems to be well-founded hopes that it will be a year of greater prosperity to the mining interest in this division than for many years past.

SOUTHERN DISTRICT—NOWRA DIVISION.

(*W. Lovegrove, Mining Registrar.*)

IN sending my report for the year 1878, I am greatly impressed with the difficulty of obtaining the necessary data for defining the yield of the gold-field at Dangera Creek, generally known as "The Yalwal Diggings." I think, however, that I can give tolerably correct information, and have to thank all parties for their kindness in assisting me.

Mr. M'Pherson, the superintendent of the Fern Bank crushing plant, and Mr. Moss, the local manager of the Pinnacle Claim, have each given a clear account of work passing through their hands.

The miners seem to have come to the conclusion to put everything through the batteries, and as this will diminish the average return, I find one of the best claims has objected to pay 15s. per ton for crushing, and has made an arrangement to give the battery one-half of the gross gold.

At the ruling price of the gold (£3 5s. to £3 6s.) this implies that they do not expect to get more than 9½ dwts. per ton, a lower result than they have yet had. They have probably 200 tons ready to go through.

Another claim has resolved to crush no more until they get rid of defaulting shareholders; another has stopped to change their method of working from shaft to tunnel; others are deficient in capital, or knowledge, or temper; and a general opinion seems to be setting in that the gold is not so plentiful further north, but I cannot endorse that view until more prospecting has been done.

One old miner informed me he had found richer ground higher up the creek, but as he does not shift there I do not attach too much weight to this.

The principal working claims are the Pinnacle and Nos. 11, 13, and 14 on the surveyor's plan. The Pinnacle being the most northerly of these has been worked under great disadvantages, crushing only at a five-stamp battery. They have therefore only crushed for the year 646 tons, and have a return of 674 ozs. 13 dwts., or nearly 21 dwts. per ton, exclusive of silver. They have now a foundation laid for a 15-stamp battery, and will no doubt increase their output to correspond. The workings are an irregular hole, about 300 feet above the water-level, and I think their present move is to make a face of the whole mine.

No. 13 adjoins the Pinnacle on the south, and is separated from it by the Creek. The party have opened a quarry, and have put the contents (70 tons) through the battery (Fernbank), with nearly valueless results, about 1 dwt. per ton.

No. 11, still more southerly, has averaged 15 dwts. on two lots of stone, 100 tons and 117 tons respectively.

No. 14, next on the south, has made a quarry at the top of the hill, in which is a reef of which the foot-wall is visible, and from which one shot will detach from 10 to 20 tons of quartz. They have crushed 210 tons, with an average result of 15 dwts., and have now arranged with the battery to crush on halves. The strike of this reef is N. and S., and it underlies about 30° E.

I have not yet noted No. 2 north of the Pinnacle. This party were foiled in their attempt to crush by the shortness of battery power. They are now putting up 10 stamps of their own, and will probably show good results, having a large body of stone readily got at. Strike N. and S.; underlay not perceptible.

It will be seen from the above that twenty-five stamps more will be at work in three months. There are also ten stamps already attached to a water-wheel belonging to Mr. Noble, but no sufficient water has been yet in the creek, as our season is very dry. The proprietor seems sanguine of success, and no fault can be found with his work, except that the race is in very loose ground; but I doubt the sufficiency and regularity of the water, and I doubt the fall.

The road from Burrier to the Gap or descent into Yalwal has been greatly and skilfully improved by Mr. Thomson, but the money has been too little by £100. If wharf and store accommodation were provided at Burrier it would probably become the port of the diggers, but there is not much enterprize available for that purpose.

In my yearly report I mentioned that one gold lease at Yalwal (No. 12/77) was being worked as a quarry on account of the large size of the reef; also that the party (Messrs. West, Harvey, and others) were then stacking the stone, as they considered 15s. a ton was too high for crushing, and they preferred crushing "on halves," which was equivalent to estimating the stone at less than 30s. per ton. I have now the honor to inform you that several parcels were crushed on the halves, and varied from 9 dwts. to 12 dwts., which was payable. But the owners of the lease, believing that they had better stone, sunk a shaft at a short distance from their quarry, and have taken out, from 28 feet in depth, 107 tons, which have yielded, in retorted gold, 347 ozs. 7 dwts.

It is possible, from the look of the cake, that they may lose 25 ozs. at the Mint, still the result would then be £1,280, obtained at a cost not exceeding £120. They cannot yet tell the size of the reef, but believe it is a distinct line from the other working. They will crush another 100 tons in a fortnight.

SOUTHERN DISTRICT—MORUYA DIVISION.

(*William Clarke, Mining Registrar.*)

IN submitting this my annual report upon mining in my division, I regret to state that the prospects during the past year have not been more encouraging than the previous years. I would also point out that as the miners in this division do not work continuously, in consequence of their following other occupations, the gold-fields have not had a fair trial.

During the latter part of the year the lease known as the Moruya Silver Mine, situated at Dwyer's Creek, was worked on tribute by Stephens and party, but as they crushed surface quartz only there is little to report. You will see by the annexed returns that 120 tons crushed yielded 25 ozs. of gold. I am confident that this lease would, if it was efficiently worked and the ore properly treated, give handsome returns, as the ore contains large quantities of silver and gold. Good payable quartz could also be obtained on this lease.

The alluvial mining has been confined to the Mogo Gold-fields, Brouman, the Moruya River, Cockroby Creek, Alexander's Creek, and Dwyer's Creek, and the operations have not been very extensive. Spedding and party spent a good deal of time and money in putting in tunnels, making a tramway and dam, and erecting a puddling machine on their lease at Ryan's Hill, Mogo, but were obliged to abandon it, as the dirt worked would not pay wages. Kelly and party began to sink a shaft on their prospecting protection area, which is situated in the parish of Tomago, and is distant about two miles from the Moruya River, and is about the same distance from the town of Moruya, but they were obliged to cease operations in consequence of their being unable to keep the water down. They intend going to work again, and will endeavour to bottom, as they have great hopes of getting good gold. Gold in small quantities has been obtained during the past year in a small creek not far from Kelly and party's shaft.

SOUTHERN DISTRICT—GUNDAROO DIVISION.

(*James Irwin, Mining Registrar.*)

THE alluvial mining on this gold-field is almost abandoned. About four months past a payable quartz reef was discovered, and a prospectors' claim and six other claims were taken up, which are at present progressing, although none of the claimholders have discovered the reef, except the prospectors, whose test crushing and result of same are given in papers attached.

SOUTHERN DISTRICT—NERRIGA DIVISION.

(*Samuel Woollan, Mining Registrar.*)

MINING matters in the division are very much depressed, and I am afraid likely to continue so, as notwithstanding the well-known auriferous nature of the country not a single shaft is at work, nor is there any prospecting doing in the way of looking for "quartz reefs" or "leads" that I am aware of. Up to the middle of the year there were four crushing plants idle in the division; these have since been removed—one to Major's Creek, the others to Yalwal. The whole of the mining operations are confined to workings on the Shoalhaven River and its tributaries, and most of the parties own a water-right, with which they work the banks of the gullies or points on the river.

A reaction may set in any day; but it strikes me the prospecting to bring about a rush must be done by the stranger, the residents not being likely to speculate.

TUMUT AND ADELONG DISTRICT—TUMUT DIVISION.

(*Henry Hilton, Mining Registrar.*)

IN transmitting my annual returns, I have the honor to report that mining in this locality may be said to be in a state of collapse.

With the exception of the Great Britain Gold and Tin Mining Co., mining is confined to a few isolated parties scattered about on the various tributaries of Sandy Creek, and eking out a bare subsistence. The prospects of the Co. referred to are assuming a brighter aspect, having surmounted great difficulties under heavy working expenses; they will shortly be in a position to wash-up, and they have every hope of being recouped for their outlay and labour.

The Consolidated Lac-ma-lac Quartz Co. has long been idle, but the directors are endeavouring to re-float it; and should their efforts prove successful, it is to be hoped a brighter mining aspect is in store for the district.

TUMUT AND ADELONG DISTRICT—ADELONG DIVISION.

(*Geo. Morris, Mining Registrar.*)

OUR gold-mining operations for the year 1878 are about the same as for the last three years, and in my opinion will remain so until greater depths are attained. We have now five steam-engines at work in the town and district.

It may be remembered the Great Victoria Gold-mining Company was the first claim to reach payable gold at a greater depth than 800, and the company secured to reward of £1,000. Since that time other companies have continued sinking, and are between 800 and 900 feet down, with payable stone. The general opinion here is that they will all pay at less than £4 per foot as a general rule. I have not yet got a return of the gold for the past year from our local Bank, but I fear it will fall short of 1877. The dry summer of 1878 will in a measure have caused the decrease, water for alluvial diggings being so short of the requirements. It has not been occasioned for want of spirit on the part of our diggers, who are speculative and energetic. It must be borne in mind we have no Melbourne speculators, and very few Sydney ones, and that those who keep the mining interest up on this field are workers themselves. That we have a brilliant future few doubt, and those who can hold on will no doubt be well rewarded for their unceasing energy. Alluvial mines, but for the reason stated, have kept up to what they have previously done, as far as the returns are concerned. Mr. A. D. Shepard, who is the principal employer of labour, has during the past twelve months been preparing for carrying out the working of his immense area on a very extensive scale, for which purpose he has secured the best class of machinery from Melbourne, and which will enable this gentleman to greatly increase the quantity of men; he has about fifty at work at the present time.

The Old United Gold-mining Company, which collapsed about three years since, was taken up by some working men, and the old ground paid wages, working expenses, and a little over. The same party have now leased 7 acres below the original, and adjoining in an easterly direction from the old workings, and they are sanguine of success. In Davis's paddock boring has been prosecuted for some time past with good prospects.

Collopy and Barr's lease is gazetted to be cancelled, they having neglected to comply with the labour conditions. Another lease, 4 acres, was also cancelled for the same reason. The thirty days will expire this month. I hear another party is likely to work it. The lease also of Collopy's, at Sandy Gully, which was abandoned, has been taken up by two men, father and son, named Willetts. They have a powerful engine, and purpose testing the ground thoroughly. The whole of those named are at Shepardstown and Grahamstown.

Retracing my steps, I come upon the crushing-machine of Messrs. D. Wilson & Co., which is situated about half a mile outside the town, on a rugged and picturesque site, on the Adelong Creek, and is fully equal, if not superior, to any other in this Colony or Victoria. Gentlemen of highly practical experience in these Colonies and America declare the details of this plant to be more complete than anything they have seen. An addition has been made, and furnaces have been erected and treated, giving results, according to richness—pyrites varying from 1¼ oz. up to 5 ozs. per ton of raw pyrites. The proprietors, Messrs. Wilson and Ritchie, are both well up in all appertaining to quartz-crushing machines, having been engaged in Adelong over twenty years. The motive-power is water, which is brought from the creek by means of a race. The driving-wheel is 26 feet in diameter, and impels fifteen head of stampers with amalgamators. Each box being separate, work can be simultaneously carried on for three separate parties. The amalgamators consist of the usual ripple tables and copper-plates, after which comes a Chilian mill for each five head of stampers, having 400 feet of grinding surface per mill. The material receiving further treatment by this mill passes over blanket-tables and cornish-ties, whence the concentrated material is brought back and re-ground by two improved Berdan pans or basins, with stationary drags; thence the whole of the tailings pass through a 24-feet diameter round buddel having Munday's patent Archimedean scrapers. This is found to be the best mundic or pyrites saving machine so far known. The pyrites caught by this machine are roasted in a reverberatory-furnace adjacent, and amalgamated in the Chilian mills. To return, the stamper-boxes are so constructed that it is physically impossible for any of the gratings to be broken. The latter, by the way, are of the best charcoal iron, and contain from 144 to 224 holes per square inch. We learn that a medium-size—say 160 per square inch—gives the best results. The detail of this stamper machine or crushing plant, though outwardly of like semblance to most others in general use, is vastly different, every portion being simplified to an extreme to do its work with a minimum of wear and tear not to be approached by any other we have seen. The Berdan pans have a solid false bottom, cemented in, and the drags are in two parts, so that the grinding weight is almost kept up to its normal state. This is an improvement effected by the proprietors, from careful observation and minute attention, and, we may add, is somewhat similar to what has since (two and a-half years later) been patented in Victoria as Harrison's patent pulverizer and amalgamator, though the latter is not quite so effective. The furnace has a long flue, travelling over 200 feet of a cutting on the hill-side; ere the chimney is reached by this means the baser metals are condensed, as they cool, and thus avoid any noxious effects. Messrs. Wilson and Ritchie find it impossible to dispense with the Chilian mills, though they have not spared expense in obtaining the most recent gold-saving appliances, for the gold at Adelong is of such a fine character that with some parcels quite one-half of the precious metal is obtained by these amalgamators which otherwise would be lost. The amount of work done by this firm is almost incredible. The quantity of quartz crushed during the year 1878 was 3,109 tons, yielding 4,554 ozs. 14 dwts. 21 grs., of which 21 tons 9 cwt. yielded 115 ozs. 7 dwts. of gold, and 16 tons 8 cwt. of pyrites. Of this latter 7 tons 18 cwt. was sent away to England for assay and sale, and 8 tons 10 cwt. not treated.

I then come upon the Williams Company's machine, which I learn has been kept going, but I am unable to give the amount of work done at this machine, which is under the able management of Jesse Harford.

The next I come upon is the Williams Gold-mining Company, also under the management of Mr. Harford. They are down 735 feet, and have a 12-inch lode. The dip is easterly; the bearing or strike 11½ degrees west of north. They employ fifteen men. The claim is payable.

The Great Victoria Gold-mining Company, also under the management of Mr. Harford, have twelve men at work. They have a winding plant, value £1,000. The depth of shaft is 810 feet; deepest level, 680 feet; lode from 4 to 8 inches, scarce any dip, but nearly perpendicular, and strike about 6 degrees north of west.

The Challenger Gold-mining Company, on the Old Hill, have twenty-seven men employed. They are working with a steam-power engine, worth about £1,200. The depth of shaft is about 520 feet; deepest level, 490 feet; lode 12 inches wide; dip or underlay 1 in 10, bearing 10 degrees west of north. From December, 1877, to December, 1878, 117½ tons yielded 207 ozs. 19 dwts.

The Flagstaff Gold-mining Company have four men at work. The prospects of this claim are very good, it giving a fine return. They have steam-power, and are down 817 feet; deepest level, 810 feet; width of lode, 1 to 3 feet, dips east, bearing 11½ degrees east of south. Mr. Joseph Hosken, manager.

The Victoria Research Gold-mining Company—Alexander Bruce, manager—have six men employed; depth of shaft, 470 feet; deepest level, 400 feet; width of lode, from 3 to 12 inches, dip east 85 degrees 15 minutes and 20 seconds, bearing 10 degrees west of north. The manager has given me full particulars. If all the managers would do so it would do good for the mining interest on this gold-field. He says:—"I enclose returns for past year. I may also inform you the reason the quantity is so small is, we were engaged for three months in the beginning of the year clearing out a shaft near our southern boundary which had not been worked in for fourteen years, and had upwards of 100 feet of mullock and water in it. We expected, from reports of men who had worked in it, that we should find a payable reef, but we were disappointed, as the reef was small and also very poor in quality, and after working three or four months on it it gave out completely. We got 60 tons of quartz during the time we were on it, yielding 50 ozs. of gold. During the past five months we have been working with our main shaft at the 250 feet level, out of which we have crushed 100 tons for 100 ozs. of gold, or 1 oz. to the ton. We have about 60 tons broken, which we started to pull up on Monday last, and expect to make up 100 tons and crush in about a month from date. We have a large extent of solid ground between us and the Great Victoria Gold-mining Company which appears to improve as we work north on it both in quantity and quality, and I am quite certain this year will be a great improvement on the last.—ALEXANDER BRUCE, Manager of the Victoria Research Gold-mining Company."

The Prouse and Woodward Gold-mining Company, and also the Little Victoria Gold-mining Company, have steam-power and the diamond drill. We have not yet had Mr. John M'Clennan's report, and are unable to give a detailed account. They have several lots of tributers at work, and we understand they have given a good percentage, and have realized good wages.

The Currajong Gold-mining Company have had a deal of bailing, but they manage to keep the water down. I had the honor to send a specimen from this claim to H. Wood, Esq., Under Secretary for Mines, who promised to place it in the Museum. The stone was excellent quality. The quantity of gold got from the crushing from which this piece was taken yielded the handsome return of 17 ozs. to the ton. The stone now being raised will come far short of this, yet it is very good, and will return a handsome dividend. Great things are expected from this claim, and I have every reason to believe the owners will not be disappointed.

Hodge Bros.' Gold-mining Company report as follows:—"This Company is in six shares, and has been working over twelve months. After working nine months they went through 30 feet of white quartz, occasionally slightly charged with mundic. They then came upon a pure mundic reef, showing gold freely. They continued sinking, and are now raising stone, the quality of which is improving, and the lode is widening out with indications of a permanent reef."

Trudgeon and White, after many years of toil and anxiety, are likely to have great success. They are now on splendid stone. The number of men employed is four. They are down 190 feet, which is their deepest level. The lode is about 18 inches; the underlay eastward about 18 degrees, with a dip of 18 inches to the 3 feet, bearing north and south. Last crushing about 1 oz. to the ton.

The North Caledonian Company—an extended quartz claim, 1,600 feet—employ five men; horse-power and whim, valued at £100. The last crushing went 1 oz. 16 dwts. to the ton; the depth of shaft is 300 feet; channel 5 feet wide; slate and black jack, with plenty of mineral; the dip or underlay to the east.

The Dr. Verschner Gold-mining Company, Donkey Hill, Adelong, have two men employed; machinery, windlass, and plant value about £30. They had a trial crushing, which went 1 oz. to the ton. They are down 70 feet; deepest level, 60 feet; lode 5 feet; dip or underlay east, bearing or striking north.

Thurloway, Hepburn, & Co. have recently taken up the Old Camp Reef ground, and had a trial crushing, which went as follows:—9 tons 6 cwt. yielded 12 ozs. 11 dwts. 15 grs; realized £4 per oz.; depth of shaft, 60 feet; lode 4 to 12 inches; dip 3 inches to the foot, bearing north and south.

Holme and Parker's claim, Louisa Gold-mining Company, recently started; value of plant, £20; men employed, two; depth of shaft, 35 feet; deepest level, 35 feet; width of vein, 6 inches; dips west, bearing or strike north and west.

The Windrum Gold-mining Company.—This has recently been taken up. The value of the plant is £30; depth of shaft, 20 feet. No further information at present.

Noah Smith and party (Crooked Sapling Gold-mining Company) had a trial crushing of 8 tons, which yielded satisfactorily; depth of shaft, 40 feet; width of lode, 9 inches; dips to the west.

Donovan and party (alluvial claim) are stripping with five men daily; value of plant, water-wheel, and pump, £40. They put about 20 tons per day through sluice-box, and have obtained 64 ozs., value £3 16s. per oz.; deepest level, 20 feet.

Homann and Sons (alluvial).—There are four men employed; value of plant, £50. They have obtained 30 ozs. of gold, which realized £3 17s. 6d. per oz.

There are twenty or thirty Chinamen fossicking up the creek, but no reliable report can be made, as the gold is supposed to go to the Chinese stores, and bartered away in Sydney with the Chinese merchants.

On this gold-field there is a very steady yield of gold. There are no sudden rushes—no spasmodic finds—no big nuggets—nothing to startle our miners from the even tenor of their ways; but there is plenty of quartz, and in that quartz more or less gold, which by steady perseverance finds its way to the Mint. The whole of it, or nearly so, is taken to the Adelong Banks, yet some goes out of the town; this is from Chinamen, and we get no record of its transmission. During the year 1878 the following quantities have been deposited in the Adelong Banks, and as the figures are authentic, they will go to show that this field is not exhausted:—Commercial Bank, 2,544 ozs.; Bank of New South Wales, 7366½ ozs; total, 9,910½ ozs. This average, at 78s., represents the value, £88,650 19s.

TUMUT AND ADELONG DISTRICT—GUNDAGAI DIVISION.

(*Chas. W. Weekes, Mining Registrar.*)

I HAVE the honor to report respecting this division that very little gold-mining is being carried on. The anticipated rush to the old Junee diggings not having taken place.

On the old reefs and alluvial workings around Gundagai mining may be said to have almost ceased, with the exception of Pyke and Champion's lease, on the "De Profundi Reef," at Jones's Creek.

The deposits of asbestos in this neighbourhood, which attracted a good deal of attention a few months ago, still await development. Several leases were applied for, but the proprietors are waiting for more definite information as to its value before spending their capital in opening out their ground. Several lots of samples have been sent to Sydney, Melbourne, and London. The question of value will therefore soon be determined. Large deposits of this mineral exist in this district, but it remains to be seen whether the sample is good enough to prove remunerative.

There are large areas of ground highly cupriferous around Gundagai which will doubtless be worked to advantage hereafter. At present the unprecedented low price of copper and the cost of carriage to the railway retard this special branch of enterprise.

The early extension of the railway to this town would give a great impetus to this industry; and I believe it only needs that advantage to make Gundagai a large copper-producing district, the operations at the Snowball Mine (about 8 miles from here) proving that the deposits are both extensive and valuable. I regret that my application for the return from this mine was not responded to, as I believe they would have afforded some valuable statistics.

TUMUT AND ADELONG DISTRICT—KIANDRA DIVISION.

(*Patrick Smyth, Mining Registrar.*)

IN submitting this my annual report of the Kiandra Gold-field I have very little of anything to add to my former report. There have been no new finds, for the simple reason that no one is prospecting. The Europeans here are all settled down in large claims, and have no necessity or desire to look for others. Most of the gold obtained is got by ground-sluicing, the Chinese alone fossicking in the old ground. The past season has been very adverse for the sluicers; many of the best claims, owing to the water taking off very early in the spring, were unable to wash up last season's work. Our only supply here is the snow water, and when that fails the water-courses dry up very fast.

The miners here have been anxiously looking forward to the promised visit of the Government Geologist, feeling assured that his report of this gold-field will be a very flattering one. As I said in my former report, the known auriferous country here is practically inexhaustible. The whole of the main range for probably 30 miles in length is of the same uniform formation, viz., basalt, pipeclay, lignite, a second layer of pipeclay, and then the wash-dirt—the latter in some places 50 or 60 feet in depth. There are miners working along the main range miles distant from each other, such as at New-chum Hill, Township Hill, Four-mile, and Nine-mile; also at the Eight-mile and Fifteen-mile, and in every instance precisely the same formation. One peculiarity of this main range is what the miners term the rim—that is, a high belt of rock extending along the range on either side, with a fast dip towards the centre of the range either way. This necessitates either the driving of a tunnel, or, as in the sluicing claims, the cutting of a deep tail-race through the bed-rock, to bring you on a level with the wash dirt. This prevents any but men of means attempting to get into the main range. Then again, the miserable supply of water obtainable for sluicing purposes is another obstacle to the sluicers; if they get twelve weeks' water they consider it a good season. As a consequence, until capital is available for supplying this real water demand things must remain as they are. There are several known good reefs, but are not working for the want of machinery. The last ton of stone ever raised out of the Charcoal Reef gave 6 ozs. 3 dwts. to the ton, crushed by Mr. Watt, of Sydney. This stone came from the 60-feet level.

The gold won, roughly estimating the claims not washed up, must be fully 200 ozs.; miners' rights issued, something near 100; and, when considering that the Chinese are working in the old ground for very small returns, leaves for the sluicers a very good return per head. Of course, had the miners permanent water the yield would be tenfold.

TUMUT AND ADELONG DISTRICT—QUEANBEYAN DIVISION.

(*O. Williams, Mining Registrar.*)

I HAVE the honor to state that by the new subdivision of my district I have no gold-field to report on except that of Micalago, which is 32 miles from Queanbeyan. I forward the report sent me by the parties working there, which, after a good deal of trouble in writing and telegraphing, I have only just obtained. By their report they do not appear to be doing well, and from other sources of information, I do not think they are. I cannot learn of any other mining being carried on in my division. There has been no demand for miners' rights so far this month, which does not look well for the progress of the mines in my division of this district.

TUMUT AND ADELONG DISTRICT—YARRARA DIVISION.

(*John K. Armstrong, Mining Registrar.*)

THE year just come to a close has been even less prosperous on this gold-field than the preceding one. It will be seen from the returns accompanying this report that both in quartz and alluvial mining but little has been done during that time, nor can the most sanguine look upon the present prospect as anything but discouraging.

There had been a few more alluvial diggers on the neighbouring creeks during the autumn and winter, when the water supply was more abundant; but on the dry weather setting in, as summer advanced, this indispensible aid for sluicing purposes so far diminished that the greater part of what was being done had to cease, the miners either leaving altogether or betaking themselves to other employment near at hand, to keep the "pot boiling" until the rain comes, so that they can again return to the work they love so well, and, if needs be, will almost starve at rather than abandon.

But the quartz-mining is undoubtedly the most important, and, however unpromising, presents the only hope of anything worth while being done in the search for gold.

That portion of the Government grant for prospecting which is expected to fall to the share of Four-mile Creek is being put to the best apparent advantage, under the direction and management of Mr. Thomas Martin, Mining Engineer, and quartz-crushing machine owner, to whose able and intelligent exertions, coupled with indomitable perseverance and, supported by shareholders whose confidence he deservedly possesses, it is mainly due that quartz mining in this locality has not long since succumbed to the many difficulties that have had to be contended with, of which, perhaps, not the least has been the effects of the general depression which has for some time prevailed in mining matters, and which renders such speculation distasteful to the public, and consequently makes support from this source very uncertain.

A further grant in aid of prospecting on the Just in Time Reef is anxiously looked for shortly; and I am given to understand that over £200 worth of shares have been locally taken up, in pursuance of this object, from which, when started, the best results of anything yet undertaken are anticipated.

That there should be so many gold-bearing reefs within a radius of about 10 miles—some five or six and twenty in number—having so few amongst them payable even in patches, and not one so throughout as yet, or an approach to it, is a state of affairs extremely puzzling to many a miner, and brings very forcibly to one's mind the more than suspicion that the knowledge of mining possessed by the great majority of miners is very inadequate, and to this insufficient knowledge, no doubt, may be attributed many failures in the search for gold.

The Chinese hereabouts couple tobacco growing with their mining operations, and appear to give their chief attention to the former, for at each camp that continues any time a piece of well-cultivated land, full of tobacco plants, may invariably be seen at the season for growing it.

On inquiry, I find that the Jingellac tin mines have so far proved a failure that all work has been stopped for some time back, and no prospect at present appears of its being resumed.

TUMUT AND ADELONG DISTRICT—ALBURY DIVISION.

(*James C. W. Crommelin, Mining Registrar.*)

I DO myself the honor to enclose herewith my return for the year 1878. There are no miners working in alluvial ground, and only the one company at quartz. The men tell me that if they had capital to open the alluvial ground it would pay well, but the water is too strong for anything but engines. There are no tin workings or copper in my division.

PEEL AND URALLA DISTRICT—ARMIDALE DIVISION.

(*Edward Marriott, Mining Registrar.*)

In obedience to instructions, I have the honor to forward herewith my "Report of Mining Operations in the Division of the Peel and Uralla District under my charge for the past year."

2. As I have already pointed out in previous reports, mining in the immediate vicinity of Armidale is confined to very few places, such as Boro Creek, Cameron's Creek, Oban, and Puddledock; and I regret to say no new gold-fields have as yet been opened in the district; and, owing principally to the severe drought with which the Colony has been visited during the past four or five years, the yield of gold has been comparatively small, and nearly all the claims have been idle during the last twelve months. The recent breaking up of the drought will doubtless enable me to give a more satisfactory report for the current year.

3. Before the close of last year I sent circulars to the principal miners in my district, asking them to furnish me with information as to the yield of gold, value of plant, &c., and have in most cases received replies thereto, nearly all of which confirm my previous statement as to the want of water being the principal cause of so very little work having been done.

4. *Boro Creek*—on Milie Creek Run, distant about 28 miles from Armidale.—From inquiries made I find that there were only four claims on which any work had been attempted during the year, and that the yield of gold therefrom is estimated at about 30 ozs., the value of which averaged £3 15s. 6d. per oz. One of the oldest miners reports: "Very little gold got during the last three years, in consequence of the continued dry weather and scarcity of water."

5. *Cameron's Creek*—situate on Gyra Run, and distant about 12 miles from Armidale.—The only persons working on this gold-field are Messrs. Alexander Gallagher and Company. They still hold the Prospectors' claim, also a 3-acre lease, and have a crushing machine erected on their machine site. They have also made a dam and races at considerable cost; but notwithstanding the large sum of money expended thereon they find the dam they have erected quite inadequate for the requirements of the claim. An attempt was made last year to crush, but the company were compelled to "knock off" for the want of water to work the machine. Mr. Gallagher recently informed me that he intends clearing out the dam and races, and starting the machine again at an early date.

6. *Oban*—situate on Mount Mitchell Run, about 40 miles from Armidale.—Mr. Thomas Clark, the principal miner in this locality, reports: "I am unable to give any useful information respecting any of the men's claims, as few of them work in one place for any length of time." Further, "It would be impossible to tell how much gold they get." The value of the Oban gold is £3 15s. per ounce. He estimates the "yield from his own claim during the year at about 25 ozs." This, it will be observed, is a great falling off as against previous years, and is no doubt attributable to the want of water. There are about twenty miners working on the Oban Gold-field.

7. *Puddledock*—on Spring Mount Run, about 12 miles from Armidale.—I am indebted on this as well as on previous occasions to Mr. Jacob Scheef for information as to mining operations in this locality. He reports: "On account of the drought the water is too scarce to wash the auriferous drift," and that "the limitation of ground, on account of a good deal of gold-bearing land being taken up as selections," are the principal causes of "such a low production." He estimates the yield of gold for the past year at "about 40 ozs.," averaging about "£3 14s. 6d. per oz." There are eleven Europeans and six Chinese working on this field.

The number of miners' rights, &c., issued by me during the year is as follows:—Miners' rights, 76; mineral licenses, 2; business license, 1.

8. I regret very much that I am not in a position to give a more favourable report of the mining industry in this district during the year 1878. I trust, however, I shall be enabled to report something better for the current year.

PEEL AND URALLA MINING DISTRICT—NUNDLE DIVISION.

(*Samuel Kermode, Mining Registrar, &c.*)

I have the honor to report respecting the Nundle Gold-fields, to 31st December, 1878.

Quartz Reefs.

1. The Wheal Prosper Gold-mining Company, at Foley's Folly, managed by Mr. John Stanning, have crushed 300 tons of quartz during this year, which yielded 136 ozs. of gold, or a little over 9 dwts. to the ton; the stone was obtained from the high levels in the mine.

2. The manager, as above-mentioned (Mr. Stanning), has lately taken up on his own account an extended quartz claim on the old reef known as the Gap Claim Reef, situated between Foley's Folly mines and Quacka-a-Nacka Creek. He has started to put in a tunnel through hard rock, which will be about 600 feet long when finished. At this point he expects to cut the reef at about 160 feet deep, which will be some 40 feet deeper than the old workings, which are at the present time full of water. This reef was worked some years back to a depth of about 120 feet, and some very good stone obtained, which yielded a good return of gold. At this depth the water came into the workings so fast that the miners at that time were obliged to abandon the claim, they not having any possible means of beating the water without such a level as the present practical and experienced miner is driving in, with a half-dozen good miners, who do their work under his instructions. It is the opinion of all persons on this field who are acquainted with this Gap Claim Reef that Mr. Stanning will some day turn out good stone, which will reward him for his perseverance.

3. **Mr. G. Bond and party from their claim—Quacka-a-Nacka—have raised some 28 tons of quartz during this year, which yielded 28 ozs. of gold, or 1 oz. to the ton; they have several tons of quartz on the surface ready for the crusher. Their deepest shaft is about 90 feet.**

4. Messrs. Joseph Patey, Bakewell, and party, Brown Snake Reef, have crushed some 37 tons of quartz during this year, which yielded 80 ozs. of gold, or a little over 2 ozs. 3 dwts. to the ton. They also obtained several small patches of gold from this claim during the year, which weighed 110 ozs. in all, making a total of 190 ozs. Their deepest shaft is down about 106 feet, and the second about 90 feet.

5. Messrs. John Shorten, Anderson, and party, Black Snake Reef, have crushed 25 tons of quartz during this year, which yielded 70 ozs. of gold, or 2 ozs. 16 dwts. to the ton. They also obtained several good patches of gold, weighing in all 378 ozs. Total gold obtained during year, 448 ozs. Their deepest shaft is about 75 feet.

6. Messrs. Joseph Clark and Cairns, prospecting claim, on the Black Snake Reef. This has been a very heavy claim to work. The reef bears up a very steep sideling, the cap of the reef being covered with about 40 feet of loose shingle and junky rock, which had to be all sluiced away into the creek before a good sound formation could be got at to start a tunnel or level. The surface of this sideling was so loose that when the miners would take or remove a few stones from the face scores of tons of soil and stones would start and slide or roll down the steep sideling, carrying trees, stumps, and everything with it headlong into the deep creek below. After the sound rock was got at, the miners soon found three separate shoots of gold, all dipping to the north, and obtained in a very short time 130 ozs. of gold, in patches. They have not crushed any stone yet. I believe this reef will pay well to crush after all the patches are handwashed and picked out. I was on this claim a day or two ago. Mr. Clark showed me some very nice specimens he had just taken out of the reef.

7. There have been a great many other claims opened along the Brown and Black Snake Reefs, most of them showing a little gold, but not enough to pay. Some of them are still being worked. Messrs. Powell, sen., and Powell, jun., and party are still sinking and prospecting their claims on the Black Snake Reef; they have obtained some very fair prospects, but nothing more as yet. My opinion is the same as a good many of the miners, that if this Black Snake Reef be sunk on to a good depth it will pay as a crushing reef.

8. Mr. James Fuller's claim, Moonlight Reef, has been worked very little during the last twelve months. At this claim there is a very good water-power quartz crushing machine idle. I believe that if this reef was properly worked and the tunnel carried in further it would yet turn out some good crushing stone, as it did some years back.

9. J. P. Robertson and party have been working in the old Foley's Reefs at Bowling Alley Point. They have taken out some 300 tons of quartz during this year, which yielded 40 ozs. and 5 dwts. of gold, or a little over 4 dwts. and 8 grs. to the ton.

10. Messrs. J. P. Robertson and H. Wilkins have lately taken up an extended claim on the old Opossum Reef at Bowling Alley Point, and have raised some thirty tons of quartz, which yielded 60 ozs. of gold, or 2 ozs. to the ton.

11. The reefs on the Peel River Co.'s estate. I cannot ascertain any particulars from the proprietors of the claims which are at work. If rumours are true, the old Marquis of Lorne is still paying well, with about 20 men at work.

12. The antimony lode at Nundle has not been worked during this year.

Alluvial Mining.

I am happy to be able to report somewhat favourably respecting the cement lead in this district.

1. Messrs. Rowe and party have just reached to a distance of about 700 feet, by a tunnel into Mount Misery on the cement. They are getting a very nice sample of gold. Mr. Rowe has a very good opinion of the cement lead. He believes it will turn out very well if properly managed, and will give a great deal of employment to miners.

2. Messrs. Clark, Wilson, and party have a tunnel into the mountain, south of Rowe and party's claim. They are in 400 feet in the cement, and are getting very nice samples of gold. This party are well satisfied with their claim, and are earning good wages; besides, they expect to get something good when fairly into the channel or lead.

3. Danger's Gully cement lead.—Messrs. John Robson, Price, Thomas, and party have a new tunnel driven into the hill at the head of Danger's Gully. This tunnel is about 300 feet long. Here they have struck the cement, showing very nice coarse gold, but to their surprise, when they had reached the cement, they found they were not deep enough with the tunnel to drain the water from the channel or gutter where the heavy gold is supposed to lie amongst the large boulders. They are now taking the tunnel in at a greater depth, and are nearly into the cement again, where, I believe, they will soon get paid for their extra labour. Work is going on night and day.

4. Messrs. Thompson, Thompson, and party are driving into the hill at the head of Danger's Gully, north of Robson and party's claim. They are looking for the cement lead. Thompson's have a fine well-made tunnel driven some 360 feet through rock. They have not yet reached any signs of the cement. I believe they will have to drive about 150 or 200 feet further before striking the lead.

5. There are several new claims lately taken up on the Mount Misery cement lead. The proprietors are preparing to sink shafts or drive tunnels into the mountain to meet the channel that contains the gold.

6. **The alluvial gold-mining lease held by Ah Sam Lowing in Oakenville Creek, at Nundle, is being worked by twelve Chinese, who are earning wages.**

7. I have not much to relate respecting fossicking claims. They are principally worked by Chinese, who still seem to make enough to keep them going. As far as I can ascertain, the quantity of gold obtained from quartz reefs in this division (not including the gold from quartz reefs on the Peel River Co.'s estate), is about 1,100 ozs.; and the quantity of gold obtained from alluvial workings, including gold obtained from the alluvial workings on the Peel River Co.'s estate, and odd ozs. that may have been obtained by prospectors from different reefs, about 1,514 ozs. Total from quartz and alluvial, 2,614 ozs. And I have no doubt another 1,000 ozs. has been obtained from the reefs on the Peel River Co.'s estate. Total quantity of gold obtained in this division during the year 1878 is about 3,614 ozs. Value, at £3 12s. 6d. per oz., £13,100 15s.

Machinery in the Nundle Division.

The estimated value of machinery in this division for 1878, about £3,700.

The estimated number of miners employed in this division during 1878 is about 118 Europeans, working quartz reefs, and 40 working alluvial claims; and about 49 Chinese miners, mining on Crown lands. And I dare say there are about 30 Chinese who do not hold Government rights working on and about the Peel River Co.'s estate. Therefore I conclude that the total number of miners employed in this division during 1878 would be about 237 in all.

PEEL AND URALLA DISTRICT—BARRABA DIVISION.

(*John Flanagan, Mining Registrar.*)

MINING Matters are at an extremely low ebb in this division. The diggings are confined to isolated parties of one, two, and three, scattered at intervals, and located at the various tributaries of Tea-tree Creek, Woods's Reef, Crow Mountain Creek, and Paling Yards Gully. At Tea-tree Creek twenty-five miners are generally employed hand-washing alluvial dirt with cradles; their earnings average about 30s. per week each. Great scarcity of water prevails. I regret that I am unable to furnish a more satisfactory report.

PEEL AND URALLA DISTRICT—BINGERA DIVISION.

(*Michael Doyle, Mining Registrar.*)

GOLD-mining in this division has improved during the past year, both in regard to the number of men employed and the quantity of gold won, than has been the case for the three preceding years. In 1875 the number of miners' rights issued was 52; in 1876, 53; in 1877, 63, and in 1878, 107; whilst at the present date there have been 131 issued for 1879, thus showing an increase in the number of men engaged in gold-mining for the past three years. There have been two or three small alluvial rushes during the year; one at Bobby Whitlow, where a new gully was opened by Rodgers and party, which gave employment to fifteen or twenty men for several months. Some very nice nuggets were obtained out of the gully, ranging from 2 to 6 ozs.; it is however now worked out. A new rush to Boro Creek took place two days before the end of the year, which at one time promised to be of large proportions. The rush was caused by a couple of brothers named M'Dermott, who have selections on Boro. It appears whilst sinking a hole to obtain water a few months ago gold was struck, and worked quietly for some time, and abandoned until the end of the year, when application for a protection area was made by M'Dermotts within their selections, which immediately caused a rush. Gold has been obtained by them in payable quantities; but other parties have not yet been successful in tracing it, owing to the water being so troublesome to contend with. There are about forty or fifty miners still on the ground, and it is anticipated that a good run of gold will yet be obtained there, as the place is known to be highly auriferous, large quantities of alluvial gold having been got out of the lower portions of the creek fifteen or twenty years ago. At Upper Bingera there are about a dozen European miners constantly engaged, besides a few Chinese. One party of four men have been successfully working a piece of ground for the past eighteen months. This ground was at one time held under lease to a party of capitalists, who employed men to cut an expensive tail-race, partly through rock, to drain the water from the point where the gold was supposed to be, but before this point was reached the company collapsed, and the lease was allowed to lapse. When the present owners entered it—and they have been making handsome returns from it for the past year and a half, and have a year or two work before them yet—other parties, seeing the success attending the undertaking, have taken up ground contiguous to them, and have got expensive pumping gear from Sydney, which they have now in operation, but it will take a week or two to tell what success they may have.

There has been very little work done in quartz-mining; a few small veins have been found with gold in them, but they invariably run out before any depth is reached. One party of Chinese at Upper Bingera have been working a vein of decomposed quartz for some months with fair success. The vein is narrow, and the Chinamen who hold it do not display much energy in working it. Three applications for gold-mining leases for quartz have been applied for during the past year, and two during the present month, which gives an indication that miners have confidence in finding a payable quartz reef in the district yet.

Several loads of copper ore from the Prince of Wales Copper Mine at Bobby Whitlow passed through town recently in transit to the smelting works at Newcastle. There is still a large quantity of ore to grass, and the manager in charge (Mr. Johnson) informs me he will shortly dispatch more of it. As the ore has not been operated on yet, I am not in a position to say what its value is.

On the whole I am of opinion the mining industry will improve in this division considerably before the end of the present year. There are a good many miners about at the present time, drawn to the place by the news of the rush to Boro, and if all do not succeed there no doubt other localities will be tried; and as there is ample room for runs of gold in places yet untried, I anticipate that better times for gold-miners are at hand in this district.

PEEL AND UBALLA DISTRICT—SCONE DIVISION.

(*J. T. Wilshire, Mining Registrar.*)

I HAVE but little to report concerning the gold-fields in this district during the year 1878, during the whole of which time almost the only quartz company existing has been idle for want of capital; little, if any, quartz has been crushed by the few miners residing there, and but a very small quantity of alluvial gold has been obtained.

The number of miners' rights issued was twenty-four, and some of these not belonging to residents of that field.

No new machinery has been imported, and the prospects of the gold-fields are the same as last year, the English Company expecting to put on a large number of hands.

PEEL AND UBALLA DISTRICT—TINGHA DIVISION.

(*Thomas Jones, Mining Registrar.*)

HEREWITH I do myself the honor of furnishing my annual report of tin-mining throughout the Cope's Creek District.

In referring to my previous reports for the years 1876-7, I find that the tin ore won in this district for the past year has most notably diminished; and it is also prominently apparent that the exodus of European miners from the district has left but an alien (Chinese) race the chief representatives of the field. It is therefore utterly futile for me to augur what change in mining activity the present inauspicious year may bring forth, the European vitality of the field being at present paralized by the unprecedented low price of tin ore; and I may state the future progress of the district is centred upon a reaction of the English tin market.

In adverting to my two previous reports, I may state that I endeavoured to give therein a detailed description of all the claims in this division, and so far succeeded in gathering information from the various mine owners throughout the field that my present report will be necessarily curtailed in descriptive matter. I therefore beg to submit only such information as is connected with the past year, and for more detailed particulars I beg to refer you to my previous detailed reports for 1876-7.

Messrs. Brickwood and Wood's claim fails to show any fresh discoveries of importance. Several inquiries during the past year have been instituted relative to fulfilment of the working conditions of their leases, which resulted in the lessees rendering themselves free from such obligation by converting their holdings into a mining conditional purchase.

Messrs. Martin and Irwin's claim has been worked uninterruptedly throughout the year, and is now nearly exhausted.

The Union Company's claims in this vicinity have remained idle. Upon the Ponds Creek a large dam has been constructed, but an insufficiency of storm or rain water fails to supply requirements for continuous sluicing. Several of these portions have been converted into a mining conditional purchase. The late gazetted reserve should tend to create a healthy impetus in tin-mining in this locality.

Middle Creek.—A few *bonâ fide* European miners are all that are now working upon this far-famed locality (for stanniferous wealth), and it offers a contrast to the activity prevailing there some six years ago, when the local price of tin ore could be quoted at £55 per ton, which has now fallen to £27 stg.

The Macintyre River.—The Karaula. Two unsuccessful attempts have been made to render this a payable claim, but owing to high rates of horse feed and low price of ore, work has been stopped for several months, but mining operations are to be shortly resumed. All other claims on this river are at a standstill.

Cope's Creek.—Kemberly township remains in a semi-deserted state, a small party of Chinese and Europeans being the only miners working in the vicinity.

Above Kemberly a party of some thirty Chinese have perseveringly worked for a considerable time, but returns show their earnings to be about 25s. per week. Captain Swinton furnishes me with returns from his various claims, which show a total of 30 tons, and twenty Chinese tributers employed; he also values the plant at £20.

The Victoria Company's claim, which passed into the hands of the Union Company, is now idle. It was worked by tributers in the early part of last year, and its returns are included in another portion of this report, which, with other claims held by the Union, is included in the aggregate return furnished by Mr. Grove. Mr. Baker's claims, represented by Mr. Litchfield, give a return of 66 tons of ore for the past year. Ten Chinese tributers are still working the claims.

Wrighton township is abandoned, owing to all the best claims in the river-bed being exhausted, and the present price of tin ore is so low that it affords no margin of profits from tributers, thus affording no encouragement for further prospecting, even where it is thought by many that deeper and richer deposits could easily be worked.

Ah Why's claim belongs to the Union Company, and though it produced 100 tons of 73 per cent. ore in the early part of the year in a few weeks, it now remains idle, not from exhaustion, but depression of the tin market.

Tingha, situated 104 miles from railway communication, is practically the capitol of the tin-field, and now suffers commercially from the absence of a more expeditious mode of transit of that product upon which essentially its existence depends, viz., tin ore. Heavy rates of carriage act as a barrier to its progress. But I gather from the cash purchases made locally, amounting to upwards of £42,000 sterling during the past year, and the requirments of a telegraph being now in demand (tenders for which are now invited), that our capital of the tin field will bear most favourable comparison with inland colonial towns of much greater magnitude.

The Britannia Company's claims, which chiefly consists of surface workings, are almost at a standstill; number of tributers employed, less than a dozen; ore won, 33 tons.

Stony Creek.—Henry Budden's registered 4-acre claim, which is at present worked by its four shareholders, continues to give satisfactory returns. Ore won, about 18 tons.

Ah Cue's claim worked out; yielded during the early part of the year about 37 tons. Tributers at work, thirteen.

Spennell's claim, transferred to Mr. S. Moore during the past year, has during the last six months yielded 13 tons of ore by a party of ten tributers. I am unable to give a return of this claim prior to possession by Mr. Moore.

Mr. Litchfield's 81 claim, known as "Dick Jones," has yielded 44 tons of ore, won by ten Chinese tributers.

Hall Bros'. claim. The tributers are still working at this claim, which has yielded 37 tons of tin ore during the past year.

Smedlegord and Ginger's claims are still working and making fair returns.

Sutherland's Water.—All the claims on this creek are worked by Chinese tributers, and from Mr. Litchfield's returns, 114 tons of tin ore won.

Mr. Grove, managing partner for the Union Company, also includes his returns from claims on this creek amongst his aggregate return.

Long Gully Claims, the property of the Union Company, have been worked but little during the past year.

I am furnished by Mr. D. Grove with the following information:—Locality of mines, Cope's Creek; number of men employed, 80 men (average); machinery, four engines, 10-stamp battery, California and centrifugal pump; value of plant, £5,000; ore raised, 325 tons (about one-third purchased); ore averaging, sold in Sydney, at £40 per ton, £13,000.

Stream tin, depth of deposit, average 21 feet; height of wash, ½-inch to 6 feet; width of wash, unknown on Cope's Creek as a rule. Lode tin, 70 feet depth of shaft; nothing done last year, rent and labour too high, and tin produce too low to make ends meet; depth of deepest level, 80 feet; width of lode, 1 foot to 3 feet; nature of country, granite; dip or underlay of lode, 1 foot in 6 feet; bearing or strike of lode, N.E. and S.W.; gems, sapphires of no value.

Mineral Leases.—Thirty-two applications for mineral leases have been received at the Warden's Office, Tingha, and submitted to the Warden for transmission to the Department of Mines. Area of ground applied for, 710 acres. The deposit fees for the first year's rent amount to £177 10s., which added to the sum of £88 received for mineral and business licenses, amounts to £265 10s. Business licenses issued, four; mineral licenses issued, eighty-five. Total amount of ore won, 1,500 tons, which valued at £30 nett, gives a return of £45,000. I would add that bags are found by the purchasers, which virtually raises the price to £30 10s. per ton. I have mentioned this at the instance of our local buyers.

Population.—The population, miners, may be estimated at 500, 450 of whom are celestials; there are also about 100 other residents in the vicinity of Tingha, including men in general business; total, 600.

General remarks.—It will be seen by the number and character of the population being more than four-fifths Chinese, that the mining industry in this vast division is but feebly represented, and has been (more particularly) during the latter part of the year prosecuted by a large majority of aliens, who are physically incapable of doing justice to so important an industry; and it is also worthy of special notice that the annual return of tin ore won, which in value locally amounts to £45,000 (forty-five thousand pounds), during the past year gives an approximative return of £90 per man per annum, or a wage of nearly 35s. per week, which is a very high rate for unskilled Chinese labour.

The fanciful fortunes pictured by New Guinea enthusiasts, coupled with "Bingera bubbles," and certainly the more alluring auriferous deposits in remote portions of this dependency, have tended to much decrease our European population during the past year.

Railway extension to Tamworth may be regarded as tending to reduce the rates of carriage, and render the mode of transit to the sea-board more speedy.

I would lastly allude to the proclaimed tin-mining reserves, which must tend to exhilarate an industry which has hitherto received but little practical legislation. In adverting to the area of this tin-mining reserve, I briefly record that it appears to me but a just recognition of tin-miners' rights and privileges, and will ultimately lead to a revival of the industry from the apathetic state into which it has fallen. It will still further prove a powerful auxiliary in inducing hundreds of those miners who are practically acquainted with the district to renew their prospecting operations without fear of molestation, and follow up mineral discoveries that have merely been abandoned, owing to a commercial glut. I would finally, in the face of the present controversy (formed to ignore the claims of a tin-mining reserve in this division), support the reservation in its entirety for a time, in order that tin-mining should not be cramped; but on the contrary, that miners should have scope for enterprise. By the conserving of the surveyed mineral portions (which fosters mining by its exemption from survey fees upon re-application for lease) and the lands contiguous which are proved stanniferous, it may ultimately prove that this vast mining division is not alone a matter of local or present consideration, but of national importance, therefore of future consequence. The returns of tin ore won from this district, coupled with the prosperity of the population it has supported for the last three years, warrants me in this exposition, and justifies the conclusion that with Northern Railway Extension (for which tenders are invited) and a very slight reaction in the tin market, coupled with mining legislation favourable to the interests of the district, that tin-mining will continue to prove a great source of wealth to the Colony.

PEEL AND URALLA DISTRICT.—URALLA DIVISION.

(*W. Dewson, Mining Registrar.*)

I HAVE the honor herewith to forward schedules having reference to the statistics of this gold-field during the past year, which have been compiled upon the best obtainable information.

Mining upon the Uralla and Rocky River Gold-field during that period has generally been carried on under the difficulty of an insufficient water supply, and where the principal remunerative operations are confined to sluicing works it is unnecessary for me to account otherwise for the small amount of gold won.

Several extensive works are at the present time being proceeded with, but as yet none of these are in a position to realize from their holdings.

First is "Long Tunnel," which is being carried in as an adit from the face of Mount Jones, in the granite bed rock, at a low level, under the wet alluvium of Sydney Flat, and from which it is intended to work the same.

This company has met with great unanticipated obstacles to the progress of its work, having had to blast through about 400 feet of hard rock, and a similar rock continuing in the face.

The distance this tunnel is driven approximates 1,100 feet; it is well secured, and has a tramway laid its whole extent.

The company has also constructed an extensive reservoir, and the operations are efficiently carried out under the supervision of Mr. Andrew Martin.

Second.—The Bullion Co. which has been formed for the purpose of prospecting the lost lead of Sydney Flat and Mount Jones.

Up to the present time its operations have been principally confined to land leased from Mr. Wm. Cleghorn, from which a small quantity of gold has been obtained.

This company has now transferred its workings to a lease upon Crown lands, and upon it a shaft has been sunk to a depth of 70 feet, where water was struck.

The company has in use a 6-horse power engine and plunger pump.

The Bullion Company is aided by the Government from the Prospecting Vote *pro ratâ* to amount expended by it, and is under the management of Mr. R. Roberts.

No other mining of importance, excepting sluicing, is being carried on upon this gold-field, and the small supply of water has had the effect of rendering that branch comparatively unproductive and unremunerative.

PEEL AND URALLA DISTRICT—WALCHA DIVISION.

(*Milton S. Love, Mining Registrar.*)

IN reporting upon the gold-fields within the Walcha Division of the Peel and Uralla Mining District, as regards the operations carried out during the year 1878, I regret to state that the favourable anticipations spoken of in my report for 1877 have not been realized, and there is but little to say respecting the enterprise and zeal of most of the miners in the district.

Glen Morrison Golden Star Company.—Crushings have taken place at Glen Morrison upon two occasions, in April and December respectively. The quantity of stone submitted by the above claim (Messrs. Thomas, Kitcher, & Co.) at the former crushing was 27½ tons, yielding 200 ozs. of gold; whilst the stone raised and crushed between that time and the latter crushing in December amounted to 20 tons, yielding 60 ozs. only. The total value of gold won on account of this claim being £950.

The depth of shaft is 140 feet, and the depth of deepest level 130 feet, the width of vein averaging 9 inches, and dipping west.

One hundredweight of pyrites, after being operated upon by a simple process of burning and grinding, yielded 8½ ozs. of gold. In the absence of proper appliances for treating pyrites a great loss is sustained by the holders of this claim.

Claim held by Maloney and party (since abandoned).—55 tons of stone were raised, yielding 72 ozs. of gold, the claim being jumped a short time prior to the crushing, in April, by Thomas H. Mitchell and others.

Subsequent to the yield the jumpers abandoned the ground, and Maloney and party have again determined to expend time and labour in working another abandoned claim.

Messrs. Keogh and Ogilvie's 25-acre Lease.—A small crushing took place in connection with this lease in April, viz., 5 tons, yielding 4 ozs. 6 dwts. After doing but little work in the shaft, either from want of capital or some other cogent reason, the miners abandoned the ground about the month of August last, returning to Victoria.

The claim has since been registered by Messrs. Scott and Burrows, who, in a very short time, ceased working.

There are not at present any other claims working upon this field.

Tia.

Tia Reef, Mr. Dennes's Station, Tia Run.—The holders of this claim crushed 2 tons of stone at Glen Morrison, yielding 2½ ozs., this being the first test of the ground by Messrs. Matheson and M'Intyre, the only two miners working in that portion of this district.

Two shafts have been sunk, one 60 feet, the other 30 feet, the width of reef in each being 3 feet and 5 feet respectively; but in consequence of heavy rains, causing both shafts to become almost half full of water, all deepening operations have been suspended.

The miners are at present engaged in tunnelling from the side of a ridge to strike the reefs, and had upon the date of my last visit attained a distance of 300 feet. 250 tons of stone have been raised, which will be treated in the locality.

A machinery site and water-race have been registered in connection with this claim, and the holders are more than sanguine of success.

I append several forms affording information respecting the various claims in this district for the past year, and, in conclusion, trust that I may be enabled to report more favourably on mining matters for current year.

PEEL AND URALLA DISTRICT—WINGHAM DIVISION.

(*J. A. Creagh, Mining Registrar.*)

No mines, either for gold or other metals or minerals, have yet been established in this district. A few claims for gold (on reefs) were marked out and provisionally registered, but were almost immediately abandoned. No persons are regularly employed in mining, but two gold-mining leases having been applied for, the ground will be tested in a short time. The Crown Lands Agent has received four applications for mineral leases (silver), but it is not yet decided that what was supposed to be silver is really such. A sample of the ore or stone shall be forwarded.

NEW ENGLAND AND CLARENCE DISTRICT—VEGETABLE CREEK DIVISION.

(*Geo. H. Gower, Mining Registrar.*)

I DO myself the honor to submit my report on the Vegetable Creek Tin-mining District for the year 1878.

The aspect of mining matters in this district has varied but little since my last annual report. No new deep leads of tin ore to be recorded, but it is equally satisfactory, if not more so to say, that the average output of tin from the chief mining properties continues to keep up its average. Unfortunately the continued dry weather and great fall in price of the metal have restricted their operations—in fact, all the shallow workings are idle. Of course a depression in the chief industry of this place has caused business to be very dull, and a good many miners are out of employment on account of the scarcity of water for sluicing purposes.

As I anticipated in my last report, the drop in the price of tin in the Home market has caused the introduction of the tribute system and Chinese labour in working the various mining properties in Vegetable Creek.

The Great Britain, Moore & Co., Rothschild's, and other large mines on the creek, have let the whole of their properties on tribute, and the yield from all of them has been noticeably larger than when being worked on the daily wages system. In most of the shallow creek mines Chinamen are employed on tribute, as are also a few parties of Europeans, but the former predominate, as they now average 287 Chinese to 186 European miners. The Chinamen are found to be steady, persevering, and work from ten to twelve hours a day, and seem to be thoroughly satisfied with their tribute, several of which pay well; this is more to be attributed from their system of working in large bands or co-operative bodies than from any advantage in ground or superiority of working. The price of tribute paid varies from £18 to £26 per ton, which leaves a fair margin of profit to the mine owners.

Another noticeable feature in the working of the mines in this district is the introduction of steam winding and pumping engines, eight of which, with an aggregate of 74 horse-power, have been erected and worked in the largest mines during the past twelve months. And it is worthy of notice to observe the gradual and various improvements adopted by the miners in working their holdings so as to raise tin economically, in order to derive some profit if possible, even at the low price the metal has ruled in the London market. The proprietors of the principal mines in this locality are deserving of praise for their energy and pluck in laying out capital to obtain these appliances, notwithstanding the disadvantage of the scarcity of rain during the year, which has materially lessened their output of ore, but also under the greater discouragement of a fluctuating and depressed market.

I am glad, however, to report that the yield of tin from this district is an improvement on that of 1877, having exceeded the output of that year by 186½ tons. This is principally due to the excellent returns of the Great Britain, Moore and party, Rothschild's, and Kangaroo Flat Mines, which have collectively raised 500 tons of tin more than they did in 1877. The European tributers in the first-mentioned mine have followed the shallow tin bearing wash into deeper ground on the bank of the creek, and it appears to improve in richness the farther and deeper they trace it. The wash-dirt is now driven out, as the stripping being about 12 to 14 feet would be too expensive to paddock as heretofore. The machinery employed on the Great Britain Tin Mine is a 10 horse-power steam-engine, which works two puddling machines—one of Mr. Wesley's tin-extracting machines (described in detail in my report for 1876), and pumps water by means of a Californian pump for the use of the sluicing appliances.

The manner in which the machinery has been re-arranged, and the economical system of working that portion of the mine let to Messrs. Martin and party on a tribute of £22 per ton, reflects credit on them; the remaining portion of the mine gives employment to ninety-five Chinese tributers. The return for the year is 519 tons.

Messrs. Irby and party have let the Little Wonder and Little Britain Mines on tribute to Chinamen, who have raised 127 tons of tin during 1878. Messrs. Moore and party's mine adjoining has also all been let on tribute to both Europeans and Chinamen, 72 in number. This property has returned 2,175 tons 18 cwt. of tin since 1872, and the yearly yield still shows no sign of decreasing. The Nonpareil and Baalgammon Mines have been idle during a greater portion of the year. Messrs. Hall Bros.' Vegetable Creek Mine continues to yield fairly, as well as the Six-mile Mine, both of which are worked on tribute.

The proprietors of the Rothschild's Mine during the earlier portion of 1878 had a 10 horse-power steam-engine, driving a 6-inch centrifugal pump, erected to pump water a height of 37 feet into a galvanized iron flume 1,000 feet long, emptying into a reservoir, from whence six sluices were supplied. Everything was substantially put up, but Messrs. Moore and party found that under the wages system they could not pay expenses; and since letting the mine on tribute, and pumping water by the engine for the tributers, who allow £1 a week per party, the outpour of ore has more than trebled.

At Kangaroo Flat Messrs. Hall, Brothers, have erected a very fine stationery vertical steam-engine of 14 horse-power, supplied with a battery of nine head of stampers, to crush the large amount of tin cement that occurs in their deep lead. This crushing plant is so placed in connection with the main tunnel driven about 2,000 feet into the basaltic hill that the tin-bearing wash and cement is trucked out by horses on a tramway from the working faces and tipped into a self-feeding hopper, from whence the stuff, after being crushed, is flumed into one of Mr. Wesley's tin-extracting machines (similar to the one used on the Great Britain Mine), also worked by a belt from the crushing machine. This method of extracting the tin is paying well even at the present market price, and Mr. Wesley's machine in connection with the battery suits the requirements of Messrs. Hall Brothers admirably as, the puddling machines and several horses having been dispensed with, it effects a more economical system of sluicing for tin. The prospects of Kangaroo Flat Mine are decidedly encouraging, as I am informed by the managing partner, Mr. J. W. Hall, that a sufficient quantity of good tin cement, yielding on an average over 40 lbs. of tin ore to the load, can be obtained to keep the company's machine constantly at work; therefore it may safely be concluded that this venture will prove remunerative to its spirited originators. The water supply at this mine has as yet, by careful use, proved ample.

The mine comprising 540 acres mineral conditional purchase, the property of Messrs Cadell and Mitchell, situated at the Y. Waterholes, near Vegetable Creek, on which I furnished a full report in 1877, is now being worked, but as this is the commencement of operations only a limited number of hands will be employed until the underground faces of wash-dirt are opened out to make room for more pickmen. At present the wash-dirt, good, bad, and indifferent, is necessarily hauled up and passed through the sluice-box, but when space is available below a second sluice-box will be placed in position, and about 100 to 150 cubic yards of wash-dirt sluiced daily.

No prospecting has been done since the date of my last annual report, as about five years' work has been disclosed in the area already proved; and in the face of the low price of tin the managing partner intends to prospect no further until the ground repays a portion of the outlay already incurred in testing it—providing and fixing machinery and plant, excavating, dams, &c.,—already amounting to between £3,000 and £4,000.

The thickness of the deposit of wash now being sent up to be sluiced is 10 feet to 10 feet 6 inches, and although the poorer portions of this face are all washed with the richer the result has hitherto shown a yield of about 20 lbs. of tin ore to the cubic yard. When space is available the poor dirt will be thrown aside, and the yield will then show a higher average. The deposit exists at depths varying from 30 to 45 feet, in loose drift and pipeclay bands, very easily wrought. The paying dirt is trucked on an underground tramway to the shaft, and there tipped into a hopper, from which it is lifted in green-hide bags, holding about 4 cwt. of stuff, by an 8 horse-power winding engine to the mouth of the shaft, and tipped at once into the sluice-box. The average speed of winding is equal to the raising of two bags per minute. The water used for the sluice-box is supplied by a 7-inch centrifugal pump worked by a 12 horse-power portable engine—is discharged vertically through a spout. The water is pumped from an excavated reservoir. about 300 feet from the working shaft, to a height of about 32 feet into a tank, from which it runs in an iron flume to a reserve tank near the shaft, and thence to the sluice-boxes, returning through a tail-race to the reservoir. The tailings are discharged into a hatch sufficiently elevated to admit of trucks running under it, and fall through valves in the bottom into two trucks running on a double line of tramway. The winding engine at the mouth of the shaft, besides hauling up wash-dirt, is further utilized for pulling the tailing trucks up an incline to the tip lead from the sluice-box by means of a rope, guided by pullies and blocks fastened on to trees growing in convenient positions opposite the engine and tailing tramway, thus doing the work of horses more speedily, effectively, and inexpensively, since one boy attends to a winding drum (used exclusively for the purpose), and three or four horses are dispensed with. In fact there is but one horse working on the mine, to draw wood for the engines. Water is usually supplied to the engines by means of a hand-pump raised on a stage fixed at the working dam, from which the water is conveyed in a canvas hose to the feed-tanks of the engines.

The tin is cleaned with a Willoughby hydraulic tin-cleaning machine, which removes all impurities with ease and certainty. The working reservoir is replenished from a dam in a gully situated about 680 yards from it. The water is raised from this dam vertically about 50 feet by a 3-inch delivery pulsometer steam pump, worked by a 5 horse-power portable engine, and thence passes through about 260 yards of canvas hose suspended on wire rope to the top of a ridge, from which point it runs in an iron flume with a natural fall to the working reservoir. There is still a fair supply in the dam, but the continued dry weather will soon exhaust even this. The working shaft is centred, and one bucket descends as the other is brought up. The proprietors have erected on their ground valuable machinery and plant, consisting of one 12 horse-power portable single-cylinder horizontal engine, fitted with a Gresham and Craven's (No. 6) patent injectors, working a 7-inch centrifugal pump with intermediate gear pullies and belting; one 8 horse-power vertical double-cylinder winding engine; one 5 horse-power portable engine, working a pulsometer steam pump with 3-inch delivery pipe; 780 feet of canvas hose fluming from the pulsometer dam to hill; 900 feet galvanized iron fluming from the pulsometer hose to working reservoir; 300 feet of galvanized iron fluming, from working dam tank to the sluice-boxes, and sundry fluming and hoses to other tanks, &c.; a double line of tailing-tramway, underground tramway with a hopper in the shaft, three large dams and reservoirs, tin house, winding engine house, blacksmith and carpenter shops roofed with iron, engine house and enclosed sheds over pumping-engine, intermediate gear, pump, &c.; stakes, and men's huts. In fact all appliances are in perfect working order, and the machinery all severally housed. These improvements are all adjacent, compact, and substantial, having been erected to last many years, during which, it is the hope of the managing partner (Mr. A. Cadell), the mine will pay well.

The prospects of this company are excellent, and although some little time may elapse before getting out much tin, yet it is quite evident that the delay will be more than compensated for eventually by good weekly returns; and with the prospect of an improvement in the price of the metal this seems to be one of the most valuable and permanent properties in this district. About fifteen hands are now employed; the full complement will be thirty to thirty-five.

On the eastern side of the Y Waterholes Creek, immediately opposite the abovementioned mine, Messrs. Swyny and M'Sorley have 80 acres of mineral lands leased to them by Messrs. Moore and party for a period of five years, at a tribute of £26 per ton of ore, on the sliding scale—that is, when tin is over 11s. per unit the tributers get half the value of the rise in the market. This party have so far prospected the land that 20 acres of surfacing have been proved payable to a depth of about 10 feet, with prospects of about 14 lbs. of tin to the load, and being thoroughly satisfied and sanguine of future results have purchased an 8 horse-power horizontal engine to work with a 6-inch centrifugal pump, lifting the water a height of 42 feet, into a wooden flume of 400 feet in length conveying it on to the payable ground. The appliances are not yet completed, but will be in a month, when Messrs. Swyny and party are confident of ultimate success.

The Vegetable Creek Tin-mining Co. (limited), at the Graveyard Creek, have also expended a large sum of money in purchasing and erecting machinery for both pumping water and winding the wash-dirt up out of the shafts. A 10 h.-p. horizontal steam-engine, working an 8-inch centrifugal pump, raising the water a height of 39 feet, has been placed close to the dam. The water is conveyed by 730 yards of canvas hose fluming to the three different points of the company's operations. This mine is at present idle, the continued dry weather putting a stop to its working, which, were water available, could be at once proceeded with, the appliances and the ground being ready and in order. A large area of ground has been prospected in this mine by 1,500 feet of drives and 700 feet of shafts, disclosing an average height of 7 feet of wash and drift, from which the manager is sanguine of good yields—by being able to sluice a quantity of dirt, which he can raise daily with the aid of a 5 horse-power horizontal winding engine and horse-whims.

Messrs. Wesley Brothers appear now to have proved the lead in the deep ground at Rose Valley, and are likely soon to be working it, and I hope to be able shortly to report good yields from their property, Thirteen shafts have been sunk, and the depth of the payable deposit is from 50 to 55 feet, with a gutter proved up to the present of 800 feet in length, 40 feet wide, and 8 feet in thickness, of good payable wash-dirt, the party expecting it to yield fully ¾ cwt. of tin to the load, the last washing having returned 4 tons 11 cwt. of clean tin from 106 loads of wash-dirt. No machinery or sluicing appliances have been erected on the claim, as it is the intention of the proprietors to make the mine pay its own expenses, as the present aspect of the tin market does not hold out any inducement for the expenditure of much capital on their property.

The Glen, Mole Tableland, Gulf and Tent Hill alluvial mines have supported a population comparatively small, and mostly composed of scattered parties, but the scarcity of rain has prevented them from being worked to any advantage. At the former place it is contemplated by some of the men working there cutting races to obtain water from the Glen Creek for sluicing purposes, which undertaking will cost no little amount of capital; still they are sanguine the result will be beneficial to them.

At the Mole Tableland I may mention that Messrs. Gaden and party expended a considerable amount of labour in attempting to prospect Wyndham's Swamp, Baldrock Creek. Finding the water too strong, which beat them out of the shafts and paddocks, they worked in, and the prospects of payable tin being very encouraging, this party were induced to cut a race 150 yards long, by about 5 to 6 feet deep, to drain the swamp, to enable them to work the lead more effectively, which when cut up into the flat was found to be not deep enough for that purpose, the water met with being too strong to keep under, except with proper pumping appliances; and operations are in consequence suspended at present. It is to be regretted Messrs. Gaden and party met with so much discouragement after the spirited manner in which they attempted the undertaking, as there is little doubt were this swamp drained that a large area of payable tin-bearing ground would be brought to light. So that although the superabundance of water is an obstacle in this locality, in other portions of the district the want of it has caused the almost total suspension of all operations.

The tin lodes are still maintaining their reputation as far as they have been proved, but the want of capital to sink shafts to a depth prevents their being proved as fast as they would otherwise be. The general aspect of affairs relative to the Gulf lodes has for a number of months been unquestionably the reverse of encouraging. Notwithstanding these drawbacks, the lodes, I am glad to notice, are again gradually attracting the attention of our community, and it is to be hoped the reviving interest will develop sufficiently to cause a fair trial to be given to that portion of the field in which they occur. It is however not possible to give much information relative to the tin lodes in this district, because but little has been done to develop them. Putting aside the fact that one or two shafts on the Gulf Lode Tin-mining Company's property, situated at the Gulf, have been sunk to a somewhat greater depth, no cross-cutting has ever been attempted. In this case the lodes or dykes appear to be worked out to the bottom of certain breaks at a depth of about 25 to 30 feet, and never afterwards picked up, although above the breaks extremely rich lodes of tin are obtained, and below them soft and finer grained granite was intersected. It is possible the tin lodes may have certain characteristics peculiar to themselves which men accustomed to ordinary mining do not understand, but at the same time it must be admitted that in no single instance have either they or the country traversed by them been properly tested. At all events the Gulf Lode Tin-mining Company's property is deserving of a far better trial than it has yet received; and it is to be hoped that since the efforts of the owners have been rewarded again by the discovery of another and distinct rich lode (as valuable as the first one) on their mine they will be encouraged to carry out their future explorations in an effective manner, and that their enterprise will meet with the success it merits.

I have sent you a box containing samples of rock from this mine, descriptions of which accompany them, kindly obtained for me from the various levels by the manager, Mr. Carr.

The Yankees Lode, half-a-mile south from the above mine, has been further prospected the last few weeks, disclosing a vein which gives promise of great richness. All that I can at present say in its favour is that active operations have already commenced by the owners, Messrs. Wilcox, Webb, and party, in order to test and develop its qualities.

Messrs. Coghlan, Clifford, and party have also discovered a tin lode in their lease three-quarters of a mile north-east from the Yankees. The specimens obtained from it show rich in tin ore, and fully warrant the belief of the prospectors that it will prove a rich property. The shaft is only a depth of 12 feet, where the vein still appears as rich as on the surface. At the Flagstone Creek the contract to sink Messrs. Heiser and party's shaft 25 feet deeper on their lode having been finished, the shaft is at present not at work. No change for the better was experienced, and the extreme hardness of the ground in this particular spot is a great drawback to the lessees' operations.

Messrs. Howarth and party applied for 40 acres on Paradise Creek, where they found a lode 2 feet through; course, north-east and south-west, underlaying west. From this body of stone good specimens have been brought to light, and the holders have a very high opinion of their find. It will, however, require further testing; at present the lessees are not working the land, waiting for the issue of the lease. The Dutchman's and Byrnes's lodes have not been further prospected this year, the intention of the owners being to secure a larger area of land adjoining (at present not forfeited) before starting work and placing machinery on the ground.

At Messrs Stuart and Co.'s Silent Grove lodes the manager is still engaged actively sinking, but I am unable to furnish any satisfactory report about their prospects, preferring to wait until the stone being raised shall have passed through the machine.

A lode containing some lead and silver was discovered on the south side of the Severn (8 miles south-westerly from Vegetable Creek), which is also traceable across on the north side of the river by the outcrop on the surface for a distance of half-a-mile. A shaft has been sunk on the lode about 12 feet deep, and at that depth it is found to be about 14 inches wide, with a belt of copper running alongside about 8 inches wide, which has on assay been found to contain 35 per cent. of copper. The galena returns about 75 per cent. of lead and about 40 ounces of silver to the ton. The owners have a party of three men at present raising 10 tons of stuff, which they intend to send to Sydney, to obtain a reliable test of the value of the lode.

Besides such well-known lodes as just referred to there are doubtless many others in this district, which will ultimately be found. And if labour and capital could be judiciously expended in a systematic and complete testing of them at different levels, by cross-cut or otherwise, the lodes in this locality will doubtless give both remunerative and satisfactory returns.

The advantages of smelting their tin at Messrs. Reid and Moffat's smelting works, situated at Tent Hill, are being recognized by the mining community, as during the year 1878 622¼ tons of tin ore have been smelted at the works, the major portion of which has been bought by those enterprising gentlemen from all parts of the district. The average price paid per ton was £32 10s. during the first six months, and £30 per ton during the latter half of the year. Messrs. Reid and Moffat have spent considerable care, labour, and capital in altering and perfecting their furnaces and arrangements, and can now turn out the metal from their works at as high a percentage as any obtained by the Newcastle or Sydney works. The advantages claimed for smelting at the mines are the saving in carriage of nearly 30 per cent., wear and tear of bags and leakage of ore in transit to port, besides the benefit of having the tin in a form that renders shipment direct from Brisbane to London possible, thereby making the cheaper and speedier route *viâ* Warwick available. During the past year 214 tons of metal were forwarded from Vegetable Creek to Queensland.

About fifteen to twenty men (all Europeans) are employed in cutting and carting firewood, burning and crushing charcoal, making bricks, and smelting. One of the furnaces has been constantly at work day and night; the other is having some necessary repairs effected to it. The fire-bricks required are made on the premises from the decomposed white granite bottom found in the deep runs of stream tin in the vicinity.

Several of the large mines still continue to forward the tin direct to their agents in Sydney, but may eventually give also their support to this new industry established in their midst by the energy and perseverance of Messrs. Reid and Moffat.

The applications for mineral lands at my office have been very few this year, being 1,880 acres as compared with 2,761 acres in 1877. This is mainly attributed to the scarcity of water all over the district, and also the depressed state of the tin market, and so far as this is concerned we need not look for much improvement until the market rules a higher and firmer price for the metal in England.

The amount of ore raised in this district during 1878 was 1,935¾ tons. The number of miners has increased to 694 all over the mines, but are principally Chinese, who have caused the increase; and the total value of plant and stock is about £16,000.

I annex a sketch of the Vegetable Creek Tin-mining District. A plan of it has, I believe, never been previously made, which would be a guide for me. The locality of the creeks which have been worked, the mines now working under the basaltic formation, and the tin lodes discovered, I have from repeated personal visits and my own observation shown in approximately correct positions.

If a careful geological survey of this district were made, and the relative positions, strikes, and characteristics of the tin lodes noted in such places as can be found, I think much valuable information might be collected for the guidance of the miners in prospecting. I would also further suggest that the boundaries of the basaltic formation in this locality should be marked out with care and shown on a map, in order that prospecting parties may be in a position to labour successfully. This area has not been properly prospected, and large tracts are yet untouched which will hereafter undoubtedly be opened with advantage. Such a work could be accomplished in a very short time, and would involve but a slight expenditure.

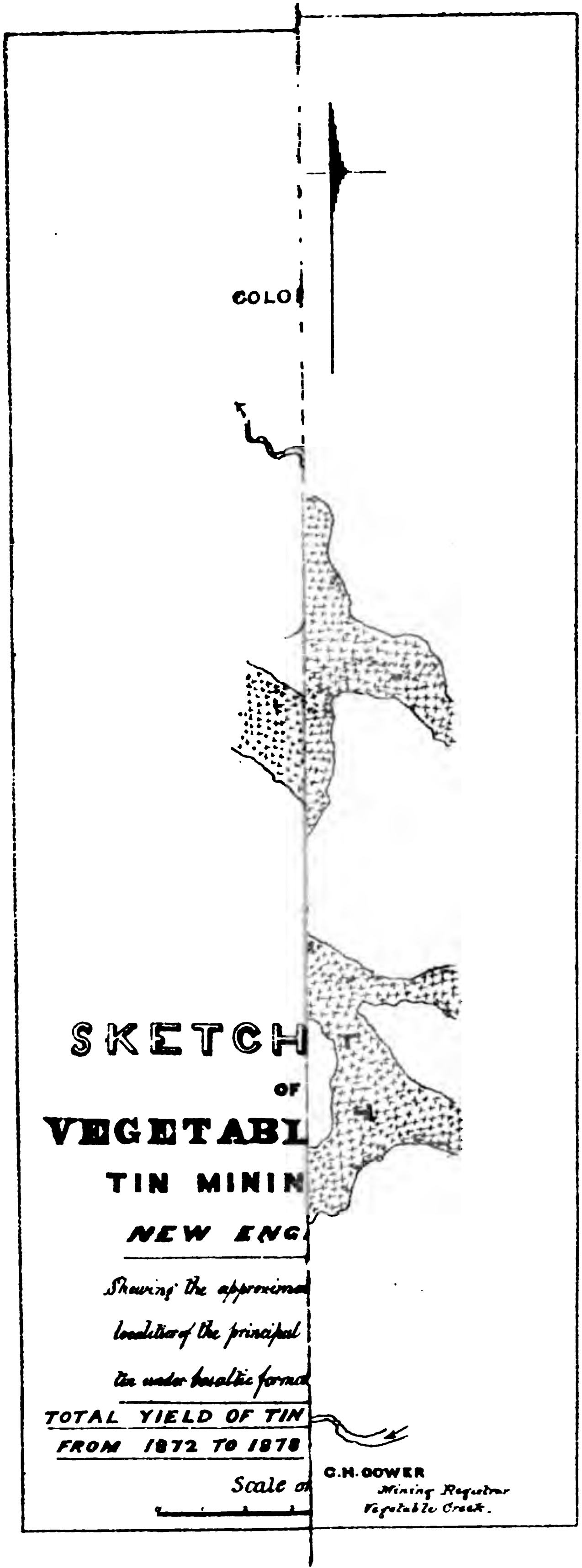
I also append in a tabular form the yearly yields of tin ore from this district since the year 1872, from which it will be perceived that the aggregate output from that year to 31st December, 1878, is 14,577 tons 2 cwt. of ore.

In the vicinity of the township of Vegetable Creek alluvial mining is gradually narrowing its operations. The shallow leads of tin in the creek-bed are being worked out more quickly than they are extending, and beginning to wear that deserted look typical of abandonment. Still, if there was a plentiful supply of water, much of the old ground would yield fair returns. In a few of the claims I am inclined to think the yield will be good for two or three years, if the present style of working be continued; after that time the deep runs, many of which may be discovered ere then, may possibly supply the deficiency caused by the giving out of the shallow.

In my previous reports I had the honor to refer to the advisability of bringing water by races from either the Severn or Deepwater Rivers on to this tin-field, and the want of such a provision has been made more than ever apparent during the past two years, which have been unusually dry. Immense areas of ground have remained totally unproductive, and the mines already developed have been but partially worked, whereas with a constant supply of water, such as a race would ensure, far more extensive and successful operations would have been carried on, and the mining population instead of being only 690 would probably have now numbered over 2,000 men. The cost of such an undertaking would be trivial as compared with the incalculable benefits conferred on the tin mines of Vegetable Creek.

THE total yield of Tin Ore from the Vegetable Creek Division, New England and Clarence Mining District, from the commencement of mining operations, in the year 1872, to the 31st December, 1878.

Name of Company or Mine.	Yield of Tin Ore during						Total yield from each mine or locality from 1872 to 1878.	Total.
	1872 & 1873.	1874.	1875.	1876.	1877.	1878.		
	Ts. cwt. qrs.	Ts. cwt. qrs.	Ts. cwt. qrs.	Ts. cwt. qrs.	Ts. cwt. qrs.	Ts. cwt. qrs.	Ts. cwt. qrs.	Ts. cwt. qrs.
DEEP LEADS.								
The Vegetable Creek Tin-mining Company (Limited.)	103 19 0	234 0 0	741 12 0	715 18 0	181 4 0	129 5 0	2,105 18 0	
Campbell & Gibson's Mine (Cubis' Tribute.)	....	....	....	217 0 0	....	....	217 0 0	
Rose Valley (Irby & party) ..	127 0 0	40 0 0	....	55 12 0	....	4 0 0	226 12 0	
Kangaroo Flat (Hall Brs. & Co.	10 0 0	50 0 0	....	3 10 0	28 0 0	106 0 0	197 10 0	
Wesley & party, Rose Valley	....	....	....	....	....	7 10 0	7 10 0	
The Springs (Hall Brs. & Co.)	6 0 0	10 0 0	....	....	....	....	16 0 0	
Surface Hill	....	....	40 0 0	....	....	3 5 0	43 5 0	
Wm. Proctor & party	....	....	....	....	9 0 0	7 0 0	16 0 0	
Surprise Mine (Irby & party)	....	....	15 0 0	17 0 0	16 10 0	8 16 0	57 6 0	
Total yield of Tin from Leeps Leads, 1872 to 1878	....	....	....	....	....	....	....	2,887 1 0
SHALLOW WORKINGS CREEK CLAIMS.								
The "No Mistake" Mine (Campbell & Co.)	30 0 0	80 0 0	80 0 0	4 0 0	10 10 0	15 15 0	220 5 0	
The Great Britain Tin Mining Company (Limited.)	28 0 0	120 0 0	431 0 0	547 9 0	285 17 0	519 1 0	1,931 7 0	
Tomisons's (now the property of the Great Britain Mine.)	85 0 0	70 0 0	....	....	....	....	155 0 0	
Little Britain, formerly Ashton's } Now the property of Irby & party.	20 0 0	100 0 0	105 0 0	126 2 0	81 0 0	76 12 0	508 14 0	
Little Wonder formerly Maund's } Now the property of Irby & party.	95 0 0	65 0 0	139 0 0	133 2 0	92 0 0	50 0 0	574 2 0	
Moore & party (including Little Minnie Mine.)	334 0 0	410 0 0	450 0 0	300 0 0	320 3 0	361 15 0	2,175 18 0	
Baalgammon (Lee & others)..	240 0 0	120 0 0	180 0 0	117 2 0	61 3 0	32 0 0	750 5 0	
Nonpareil (Marshall & party)	316 0 0	150 0 0	122 0 0	51 2 0	21 0 0	3 0 0	663 2 0	
Vegetable Creek Mine (Hall Bros. & Co.)	230 0 0	120 0 0	80 0 0	78 0 0	80 0 0	57 0 0	645 0 0	
Rothschild (Moore & party)	150 0 0	110 0 0	115 0 0	85 0 0	62 10 0	206 18 0	729 8 0	
Six-Mile (Hall Bros. & Co.) ..	90 0 0	80 0 0	60 0 0	36 0 0	40 0 0	26 10 0	332 10 0	
Gordon's	38 0 0	40 0 0	80 0 0	5 15 0	14 10 0	7 5 0	185 10 0	
Tent Hill (Hall & Co, Moore & Co., and others.)	195 0 0	60 0 0	50 0 0	46 0 0	15 0 0	8 0 0	374 0 0	
Tent Hill Creek (including M'Master's.)	107 0 0	40 0 0	10 0 0	37 0 0	8 0 0	42 0 0	244 0 0	
Glen Creek (Banca, Glen Lode, and other Companies.)	46 0 0	70 0 0	49 0 0	38 0 0	21 0 0	15 0 0	239 0 0	
Gulf Creek (including 194 tons, Gulf Stream Co.)	72 0 0	50 0 0	75 0 0	62 0 0	232 0 0	88 10 0	579 10 0	
Mole Tableland (approximately.)	200 0 0	80 0 0	100 0 0	73 0 0	50 0 0	30 0 0	533 0 0	
Y Water-holes Creek (including Brown's and other M.Ls. Graveyard and Big Ben.)	34 0 0	50 0 0	80 0 0	77 12 0	14 10 0	62 15 0	318 17 0	
Y Water-holes (Moore and party's property.)	15 0 0	....	....	155 10 0	105 5 0	31 18 0	307 13 0	
Grampians (Hall Bros. & Co.)	20 0 0	100 0 0	40 0 0	27 0 0	....	6 10 0	193 10 0	
Connolly Tribute (Irby & party)	....	....	....	....	....	29 10 0	29 10 0	
Total yield of Tin from shallow workings, 1872 to 1878	....	....	....	....	....	....	....	11,690 1 0
TOTAL...........	2,591 19 0	2,249 0 0	3,042 12 0	3,008 14 0	1,749 2 0	1,935 15 0	14,577 2 0	11,577 2 0


COLO
SKETCH
OF
VEGETABL
TIN MININ
NEW ENG
Shewing the approxima
localities of the principal
tin under basaltic forma
TOTAL YIELD OF TIN
FROM 1872 TO 1878
Scale of
C.H. GOWER
Mining Registrar
Vegetable Creek.

NEW ENGLAND AND CLARENCE DISTRICT—DALMORTON DIVISION.

(*William F. Poole, Mining Registrar.*)

QUARTZ-MINING operations are now entirely suspended in my division, and although we have sixty-four distinct quartz reefs (some of them yielding as high as 2 ozs. per ton), there is not sufficient energy or enterprise in the district to develop one of them. Two parties of Chinamen arrived here last month on a prospecting tour. They state that if they are successful, hundreds will follow from the tin mines. One party has already got prospects to induce them to make cradles, sluice-boxes, &c.

At Cunglebung, owing to the protracted drought, very little has been done. Several parties of Chinamen have been there to prospect, but scarcity of water has compelled them to leave before giving the place a trial. Since the copious rains we had last month another party of Chinamen have gone out, with what results I have not yet heard.

NEW ENGLAND AND CLARENCE DISTRICT—LUNATIC DIVISION.

(*M. J. Synge, Mining Registrar.*)

I AM gratified to be in a position to state there has been a considerable increase in the yield of gold for the past twelve months above that of last year, notwithstanding the extreme drought which prevailed from the month of May till November inclusive. This is chiefly owing to my having been able to collect the approximate amount of gold obtained at the Timbarra River, Poverty Point, and M'Leod's Creek workings.

There is a slight decrease shown in the yield from Tooloom, Pretty Gully, and Lunatic Fields. At Tooloom very little alluvial mining has been done, owing to the scarcity of water. On the Pioneer Reef, at this place, the Prospectors' Claim is now 195 feet deep, and a parcel of stone of 34 tons taken from that depth and crushed in May last yielded 67 ozs.. They have another lot at grass, which will be milled as soon as there is sufficient water to drive the machine, which is a 4-stamp battery, worked by water-wheel. This is the only claim at present occupied on this line of reef.

Pretty Gully still maintains a small population of alluvial miners, who appear to be making moderate wages. The reefs at this place are now abandoned. About 20 tons were crushed from the Lincolnshire Reef, which only yielded about 3 dwts. per ton.

At Lunatic there are at present but four claims occupied, viz.:—The Dalmorton, the Shoobert Company, Lunatic Reefs, Horton and Son. No. 1 Golden Crown and J. Lyons and Company, Victoria Reefs, this last being a new discovery, with excellent prospects, fair wages having been made since starting, by hand-crushing only.

The Dalmorton still yields well, a lot of 10 tons crushed a short time since having given a return of 3 ozs. per ton.

From Horton's Claim, on the No. 1 Golden Crown, splendid specimens are being constantly procured.

The Shoobert Company intend starting as soon as necessary repairs are effected to the machinery; they have about 80 tons of quartz at grass. The Antimony Mine (late Hercules Smelting Company) is now being worked by Mr. R. Horton, and returning profitably; 6 tons of this metal was raised by the above company this year, who then abandoned the ground. Horton and Company since occupation have sent away 4 tons.

At Poverty Point, Timbarra, M'Leod's Creek, &c., the number of miners has increased, as also the yield of gold, during the latter part of the year. The approximate yield from these places for the past twelve months being 2,000 ounces. The Surface Hill Sluicing Company at Poverty Point will soon have completed their tunnel, having 14½ chains to cut, when a large increase on the yield may be expected, as this claim alone employs fifteen men, which number will be largely increased when sluicing operations commence. The Co-operative Company are also working with profitable results notwithstanding the long scarcity of water. Several other sluicing claims are being worked on the Timbarra River, M'Leod's Creek, Pegleg Gully, and other places, and evidently paying moderate wages.

Boorook has been the principal attraction in this district for some time. Silver was discovered in this place by Mr. L. Horton, the latter end of last year, who then at once provided the machinery and other amalgamating appliances for extracting the metal, the result of which, viz., silver returns of Mr. Horton, will fully prove the value of the property, as from the thickness of the lodes and the quantity of them there appears to be an inexhaustible supply of ore. Several machine sites have been applied for, but no other machinery is at present in course of erection. There is not the slightest doubt before the termination of the year 1879 Boorook will have established itself as one of the grandest mining districts in New South Wales, as by that time the treatment of the ore will be better known to the claimholders; as yet it is the general impression that but a small percentage of the metal is extracted by the present appliances.

Taking into consideration the state of the district at the beginning of the year 1878 and at its close, I should surmise there has been a marked improvement in mining affairs generally.

The value of gold known to have been obtained in this district for the past year is £9,592; silver, £1,575; total £11,167 sterling,—this being the produce of Timbarra, Tooloom, Pretty Gully, and Lunatic Gold Mines, and Boorook Silver Mines.

NEW ENGLAND AND CLARENCE DISTRICT—LIONSVILLE DIVISION.

(*James Fisher, Mining Registrar.*)

I HAVE the honor to report that the earlier part of the year 1878, was exceedingly barren of incident,—the miners both in quartz and alluvial workings were labouring under the disadvantage of a scarcity of water.

The only two quartz claims which were in operation at the commencement of the year, viz., the New Lion Company's Mine and M. Lawless's Shellmaleer Claim, have been abandoned,—the former for the want of funds to carry on work with, the latter after a crushing of 120 tons, because it did not pay the proprietor, although the result reached a little over 8½ dwts. to the ton. But the cost of carting and crushing did not leave a sufficient margin for raising the quartz. The former company's mine offers a very good chance for a tribute company, as the mine is opened to a depth of 412 feet, and the necessary tools and machinery are upon the ground. The company have been working for the last three years upon an immense "horse," which appears to be nearly pierced in two places in depth and in the 40-feet level to the north. On the top of this horse fine specimens were found, and the quartz from each leg has been several times assayed and has always proved auriferous.

The men who were employed in the Shellmaleer Mine, after being thrown out of employment by the stoppage, took up the abandoned "Band of Hope" prospecting claim and purchased a small 5-stamp battery with water-power from T. Bawden, Esq., M.L.A., and at a considerable outlay both of time and of money built a shoot and tramway from the tunnel driven by the former holders of the claim to the battery, calculating that 5 dwts. to the ton would pay them; and undoubtedly this would be the case if they could rely on the permanence of their water supply, but until the rain set in they could crush nothing. Since the wet set in, however, they have been able to crush one shift per day, by storing the right-water in a dam, and are working thus at present.

The alluvial miners have very largely increased their earnings during the wet weather; in fact during the last three months by far the largest part of the alluvial gold has been won, and as a matter of course business is somewhat brisk.

There are no mines other than gold worked in my district. The wash-dirt is never puddled, all being worked in sluices, ground or box; no nuggets are found, the gold being fine.

New England and Clarence District—Ballina Division.

(*Henry Bassmann, Mining Registrar.*)

There has been nothing doing during the year in this division; the few persons who have obtained miners' rights here have only been prospecting for a short time through the division, and I have not heard that they have obtained anything beyond the colour.

New England and Clarence District—Wilson's Downfall Division.

(*William Hicks, Mining Registrar.*)

I do myself the honor to forward my annual report for the year 1878 on the progress of the tin-mining industry in the Wilson's Downfall Division of the New England and Clarence District, and in so doing I beg to state that the yield of ore on the field for this year is not near what I expected it would be when forwarding my last report. The main creeks being almost worked out, the work at present going on is in the banks and old workings, which yield badly and are very uncertain and patchy, therefore it is impossible to give anything like a correct description of the leads or run of tin, the depth of deposits, height or width of wash, &c.; and if we do not have some new finds shortly our tin-mining industry on this field will be extremely limited by the end of 1879, as a great number of the miners at present mining cannot make wages by it, and some do not find sufficient to keep their families in rations.

The only claim worth notice here is Amosfield (or Herding Yard), the property of A. and R. Amos, under the management of Mr. William Seaman, who employs about 100 (one hundred) Chinese and 20 (twenty) Europeans on tribute; the latter are washing tailings, and doing very well. The total amount of ore won on this claim for 1878 is 300 tons (three hundred), being a decrease upon that of last year of 200 tons (two hundred). The number of men employed in 1877 being seventy-five Europeans. Their plant, which is extensive, is valued at £550.

The total amount of tin ore raised on this field for the year 1878 is 1,107 tons, being 288 tons less than last year; and the number of men employed in 1878 is—Europeans, 65; Chinese, 457; being a decrease last year of Europeans, 100, and Chinese, 13. Herewith I beg to forward returns, as accurate as I possibly could obtain them.

Not within a Mining District.

Bourke District.

(*Jas. Harvey, Mining Registrar.*)

Only one miner's right has been issued in this district, nor have I heard of gold being obtained, although there is supposed to be some in the neighbourhoods of Cobar, Mount Oxley, and Gunderbooka, but I am unable to say whether in payable quantities or not. There is but one mining company in this district, viz., the Great Cobar Copper-mining Company, situated at Cobar, 120 miles south of Bourke, the plant of which is valued at £25,000; and during the year there has been an average of 400 men employed, who have raised from a lode 40 feet wide 8,398 tons of ore, which when smelted yielded 1,468 tons of copper. The different descriptions of ore obtained at this mine are carbonate, oxide, and sulphuret copper ores, and iron ore mixed with the copper through the lode. There are also ores obtained containing bismuth, gold, and lead, but none of them having been treated I am unable to give the quantities.

I have been informed on very good authority that through there being no natural water supply the continued droughts of the past four years, and the great want of proper water reserves and railway communication, the development of this very rich mine has been much retarded. Also, that other mines of equal richness in that neighbourhood have not been opened up from the above causes.

BERRIMA DISTRICT.

(*F. R. Wilshire, Land Agent.*)

I HAVE the honor to report that during the past year, beyond a considerable extension of works at the Joadja Shale Mines and the driving of a few adits into various outcrops of coal seams in the neighbourhood of Nattai and Berrima, much has not been done towards the development of the extensive and well-known coal, kerosene, shale, and iron ore deposits of this district.

With regard to the Joadja Shale Mines, the owners (Messrs. Lamb, Gilchrist, & Co.) have been pushing on the works with considerable energy, and already a large machinery plant has been brought there, and extensive buildings erected in connection with the proposed large retorting establishment about being formed there. The owners expect to be fully prepared in a few months to commence operations on a large scale at these retorting works.

Several miles of tramway have been constructed towards the Great Southern Railway, near Mittagong over which considerable quantities of the shale are now being forwarded *en route* to Sydney.

Little or nothing has yet been done towards the devolpment of the valuable coal seams of the district. An attempt has certainly been made to form a company to open out some of the coal seams near Nattai, but the coal yet tried does not come up to the expectations as to quality, though further efforts are being made there to obtain, if possible, a coal suitable for locomotive purposes.

Some gentlemen have also interested themselves in getting a test made of coal from Mr. Atkinson's mine, near Berrima. This coal is said to be of excellent quality for all ordinary purposes, and it is expected that when driven well into it will prove suitable for locomotive purposes, coal from the immediate neighbourhood (400 yards off) having some years back been carefully tried by the Railway Department and pronounced suitable for their requirements.

There are besides several known outcrops of coal towards the southern portion of the district, but the seams are said to be very narrow, and where thick enough to work are intersected by many clay-bands, &c., both injuring the coal itself and rendering the seams far more expensive to work.

It is a noticeable feature in the coal seams of this district that the further south they are examined, after leaving Wingecarribee River, the narrower and more inferior they appear to become, as if "wedging out;" they contain more "bands," as a rule, and undulate or "roll" considerably, varying in thickness repeatedly from 7 or 8 feet to as many inches in a space of less than 100 yards. This feature is distinctly observable at the Rock Roof seam and at Black Bob's Creek, &c. A little beyond these outcrops, towards the south, the coal measures finally terminate.

REPORT OF INSPECTOR OF MINES.

(*W. H. J. Slee, Inspector.*)

IN furnishing you with this report for the year 1878, I do myself the honor to inform you that since the breaking up of the late severe drought the rainfall has been such as to enable quartz-crushers, sluicers, and others to follow their vocation with somewhat greater facility and success.

Regulations for the Inspection of Mines other than Coal and Shale Mines.

These regulations are frequently recognized by the mining community as a great boon conferred on them. Preventible accidents are now of less occurrence than formerly, even if due allowance is made for the decrease of our mining population. I am happy to state that even in the Hill End and Tamboroora Mines, where accidents were of such frequent occurrence, no fatal accidents have taken place during the year 1878, whereas two fatal accidents occurred during the first quarter of 1877. However some thirty (30) graves in the Hill End Cemetery bear a lasting and undeniable testimony to the great loss of life (from fatal accidents) in the Hill End and Tamboroora Mines, and the consequent misery and privation sustained by many families prior to the issue of the above named regulations.

False economy and wilful negligence are now less frequent, because managers and miners fully understand their great responsibility under these regulations. I would respectfully suggest that in any future legislation on this subject the power of supervision should be extended to all metallic mines, whether on private or Crown lands, especially as of late years large areas of auriferous and mineral lands have been alienated from the Crown.

Prospecting.

Since the breaking up of the drought prospecting for gold has been carried on with renewed vigour, in some instances with success; but many of our gold-miners, including some of our veteran prospectors, have been impoverished by the late severe drought to such an extent that they will either have to look for different employment or receive aid from the public for prospecting purposes.

There is no doubt that the £5,000 voted this year by the Legislature for prospecting for gold will prove beneficial not only to the mining community but to the Colony at large, to what extent is impossible to predict at present. I would respectfully suggest to the Honorable the Minister for Mines the expediency of placing a sum of money on the Estimates for the year 1879 for the purpose of assisting miners in prospecting solely for new gold workings. Regulations could be framed for the due protection of the public purse, but miners should be allowed to prospect wherever they choose within the Colony of New South Wales.

The opening up of new gold-fields in New South Wales would not only benefit our present population but would also greatly conduce to bring to our shores a superior class of unassisted immigrants.

Cancellation of Leases.

During the year many of the gold-mining leases on our gold-fields have been cancelled, the majority through the non-compliance of the labour conditions. Some of these leases which had been lying idle for years are now profitably worked by individual miners or co-operative companies. If regulations could be issued by which the informant or the person who has given all necessary information for the cancellation of a lease should be considered the first applicant, and that applicants for gold or mineral leases should be compelled to put on at least one-half of the labour required under the conditions of their applied for lease within two months after application, and the other half one month after issue of lease, great benefits would undoubtedly accrue, and the increase in the produce of gold and minerals would be considerable.

Such regulations would not interfere with the *bonâ fide* capitalist, to whom extension of time could be granted if good cause could be shown; but these regulations would be a stumbling-block to those who after paying for a lease have not the slightest intention of spending any capital to develop the same. These latter persons merely hold their leases by dummyism until some enterprising industrious persons prospect the ground in the belief that said ground or lease is abandoned; and this belief gains strength by the fact that while nothing payable is struck nobody claims or interferes with the working or prospecting of said lease, but let payable gold or other minerals be struck, and the party will at once be politely informed by these drones (misnamed capitalists) of our gold and mineral fields that they paid for and claim the lease; and therefore the party who found the payable gold or mineral, after perhaps months of toil and expense, have either to pay a high tribute or be sued for trespass and turned off the lease. This is a very common occurrence both with gold and mineral leases.

Alienation of Crown Lands.

There is still difference of opinion concerning the alienation of Crown lands on our gold-fields. Some persons advocate that 30 acres should be allowed for miners' residences. I venture to predict that if such a thing was allowed gold-fields would soon be a thing of the past. The land shark, who is ever ready, would soon pick the eyes of our gold-fields. I am of opinion that on gold-fields which have been worked, say for ten years, the holders of miners' rights or business license should be allowed 10 acres as a *bonâ fide* homestead, any part of which should be open for gold-mining purposes, on condition that the parties entering said homestead blocks for mining purposes pay all cost for actual damage done. All well-known quartz reefs or alluvial workings, if fenced in by any person, should be thrown open to the miner without any damage being paid.

Our Mining Districts.

The principal mine at work at Hill End is the Star of Peace; it is now the mainstay of this place as far as the employment of labour is concerned. The company has lately erected a battery of 15 stampers for quartz crushing purposes; they intend to add the latest and most effective gold-mining apparatus for the treatment of their blanketings and pyrites. An assay of stone containing arsenical pyrites from this company's mine gave 5 ozs. of gold per ton, a great percentage of which is lost by actual crushing, especially at machinery which has no proper appliances for the saving of pyrites and extracting of gold therefrom. At the end of this year there were between 400 and 500 tons of stone at grass to be treated by the company's new battery. The deepest part of the Star of Peace Company's mine is over 700 feet.

Several of the principal mines on Hawkins' Hill are idle, but why they should be so is certainly a mystery. In the year 1873 Beyers and Holtermann's Gold-mining Company crushed out of 415 tons of vein stuff 16,279–63 ozs. of gold; value, £63,234 12s sterling; and still this mine is only about 380 feet in its deepest part.

Krohman's Company is also idle. This company crushed out of 436¼ tons of stuff 24,079 ozs. 8 dwts. of gold; value, £93,616 11s. 9d. sterling. Although this enormous yield was obtained, and the company (like that of Beyer's and Holtermann's) paid back to the shareholders in less than twelve months more than their orignal capital, still the greatest depth is only slightly over 400 feet.

Carroll and Beard's, the adjoining mine, is also idle, although it cannot be said with justice that Carroll and Beard's Gold-mining Company have lacked enterprise and perseverance they undoubtedly have done a great deal of prospecting with an inadequate return for their outlay. Nevertheless, I am of opinion (which is backed up by many practical miners on Hill End) that instead of Carroll and Beard's, either Krohman's or Beyers and Holtermann's should have been sunk to the perpendicular depth of at least 1,000 feet.

I am aware there are persons who seem to think that as the directors of the Star of Peace have shown a keener foresight in securing all the eastern country it would be useless for any of the companies from Paxton's to Carroll and Beard's to sink to a depth of 800 feet, as by so doing they would only prospect for the Star of Peace Company. This would undoubtedly be the case were the gold to follow the veins which have an easterly underlay, and which therefore at a depth of less than 800 feet enter the Star of Peace ground. There is little doubt that on the northern end of Hawkins Hill the gold tends to the east, but not so on the southern end, which seems just the contrary. For instance, the gold in the Monte Christo, Beyers and Holtermann's, Krohman's, and Carroll and Beard's has never travelled to the east. In the Monte Christo the gold was first found in Paxton's foot-wall vein, which was payable from the surface to the 120 feet level, where the gold was lost, the vein still running regular, underlaying about 1 foot 9 inches in the fathom to the east. By sinking the shaft perpendicularly the gold was again found about 25 feet deeper, but 9 feet west of Paxton's vein. In this vein, which is called the middle workings, the rich gold was worked down to the 180 feet level and again lost, but the vein, like Paxton's, keeping well defined and underlaying to the east. The gold, however, was again found 8 feet west of the middle workings and worked down to the 260 feet level. This vein is called the western working. After this the shaft was sunk 65 feet deeper, which makes the total depth of the Monte Christo mine only 325 feet, and still several crushings out of this mine gave 200 ozs. of gold per ton.

Here then is a plain practical proof that the rich run or shoot of gold on the southern part of Hawkins Hill veins does not follow the veins in their eastern underlay, but rather strikes slightly to the west.

What is proven beyond doubt in the Monte Christo mine is also the case in the adjoining mines, such as Beyers and Holtermann's, Krohman's, and Carroll and Beard's mines. In the latter the gold was never found payable more than 6 feet easterly of their perpendicular shaft.

If a perpendicular shaft were sunk on the northern part of Krohman's mine to such a depth as to intersect those belts of veins which run over 100 feet west of the former gold-bearing veins the probability is that the rich shoot of gold which was lost near the 300 feet level would be found to have taken an almost perpendicular course, jumping or running from the eastern into the western veins.

If Beyers and Holtermann's, Krohman's, and Carroll and Beard's were amalgamated into one company they would have quite sufficient machinery and extent of country to sink a deep perpendicular shaft for a second shoot or run of gold.

Many quartz mines which are lying idle in all parts of this Colony would again prove payable and rich if more sinking and cross-cutting were adhered to, and parties working the same would more closely observe any change in the country, such as faults in the veins, leaders or spurts coming from or making into the vein, so as to be able to form a fair opinion where to prospect when a shoot or run of gold is lost. For instance, the Lady Belmore lease was formerly worked by a limited company, but the lease was abondoned as worthless, and cancelled. A party of eight shareholders, however, re-applied for the ground in June, 1877. The extent of ground is about 2½ acres, on which the present company have sunk two shafts, each about 80 feet in depth, connected by drives with each other. Their present payable vein averages from 4 to 5 inches in thickness. Other veins are known to be in the ground, but have not been tested.

Since the present company have been formed five men have been constantly at work. The company have crushed 71 tons of quartz, with a total yield 551 ozs. 18 dwts. 2 grs., or at the rate of nearly 8 ozs. per ton, or £2,071 9s. 6d. nett return for five men's work in eighteen months, giving nearly £25 per week per man. The whole expenses, excluding wages, are below £150, and a considerable part of the labour has been expended in preliminary works, such as sinking shafts, &c.

The Adrianople.—On Little Hawkins Hill, about half a mile due west from the rich mines of Hawkins' Hill, is a 15-acre lease, held by a company of twenty shareholders. A tunnel has been driven into the hill; present length 180 feet; several quartz veins have been struck, but none gold-bearing. This is the only purely prospecting company at work about Hill End.

Red Hill, Tambaroora.—This ground contains a large body of stone, with a number of gold-bearing veins running through the rock. Perhaps if this ground were more systematically worked it would be a valuable property. There is a fine crushing and pumping plant on the mine, and every appliance for working the same.

Emu Creek Gold-field.

On this gold-field mining is still very dull, although a new reef has been opened during the year on the O'Brien's Hill. There is but very little doubt that if the country around were better prospected Grenfell would again be a flourishing mining town.

Burrangong Gold-field.

The miners on Lambing Flat and Wombat have done very well during the winter season, but miners, as a rule, are very reluctant in giving information as to their earnings; but one party of four men informed me that they obtained about 150 ozs. of gold for twenty-two weeks work, and other parties have done similar. There are about twenty-four different parties occupied in sluicing operations during wet seasons.

Adelong Gold-field.

On this field mining has taken a turn for the better during the last six months. On the Victoria line of reef Annett's Company are still on payable gold, and on the old line of reef several of the abandoned claims have been re-occupied.

Trudgeon and White, who struck gold during the last two months, are enterprising and persevering miners. They have been prospecting for several years on the Caledonian Reef, and they deserve the greatest possible reward.

As I was unable to visit Adelong in time before closing this report, I put myself in communication with Messrs. Trudgeon and White, and in answer received the following reliable information from David Wilson, Esq., J.P., quartz-crusher, of Adelong:—

On Monday last, the 6th instant, I explored Messrs. Trudgeon and White's mine. They have sunk two shafts—one north, the other on the south end of their mine. At the former they did some driving, but finding nothing encouraging they left it and went in the south shaft, which is about 190 feet deep. At the 180 feet level they put a drive north, with no success. They then put in a drive south about 30 feet in length, when they met with leaders dipping very rapidly to the south. Here they sunk a winze 25 feet in depth, and in driving another 25 feet they found the leaders joining and making a very nice reef. The stone is of the right sort, carrying gold and mundic; but still, in my opinion, the country is not quite sufficiently settled to carry a large permanent lode, although from present indication I am strongly of opinion that a permanent reef is not far distant.

The Caledonian Reef in the higher levels has hitherto yielded well. The gold has averaged about 4¼ ozs. per ton; value £3 18s. per ounce.

My long experience of the Adelong Gold-field is that if rich gold which has been worked from the surface runs out a second shoot or run of gold is met with generally as good as the first; and I see no reason why this should be an exception. Trudgeon and White have about 10 tons of stone at grass, which I estimate at 4 ozs. per ton. The reef, which is as yet not properly defined, is about 15 inches thick. The lode dips to the east about 18 inches in the fathom.

I am also indebted to Mr. Wilson for the following information:—

Wilson and Ritchie's machine crushed during the year 1878 3,109 tons of stuff, which yielded 4,554 ozs. 14 dwts. 21 grs. of retorted gold, thus giving about 1½ oz. per ton. Wilson & Co. also treated 28 tons 8 cwt. pyrites, from which they obtained 115 ozs. 7 dwts. of smelted gold. 7 tons 18 cwt. of pyrites have been sent to England for treatment.

Mr. Wilson also informs me that he has overcome all difficulties in the way of roasting and amalgamating.

In my annual report of 1876 I gave a full description of Wilson & Co.'s crushing and gold-saving apparatus, which are of the best, if not the very best in New South Wales; and I am still of the opinion that the Adelong quartz-reefs will again come to the front as rich gold-producing mines.

In the Bathurst and Orange Districts, parts of which I visited during 1878, mining is still stagnated, but if prospecting was more rigorously carried on beneficial results must follow, especially among the Abercrombie Ranges, from which I sent you full reports during my visit at Trunkey Creek, Thompson's Creek, &c.

IN the Kiandra, Tumbarumba, and Adelong Districts large tracts of apparently auriferous country deserve to be tested by the prospector.

On a former visit to these Snowy Mountains I pointed out that large valleys, presenting every indication of being highly auriferous, had never seen the pick of the miner. If water could be brought for sluicing purposes from the head of the Tumut River to Kiandra a vast tract of country would prove to be not only payably auriferous but of immense richness.

I hope the time is near at hand when hydraulic sluicing will be introduced, not only amongst these Australian Alps but also in other parts of the rich but only partially worked-out gold-fields of New South Wales.

During my recent visit a few days since I felt I should be wanting in my duty were I not to draw the public attention to these parts. Miles upon miles of basaltic country, or rather a chain of basaltic hills, stretching from Upper Adelong past Tumbarumba, a distance of fully 30 miles, has been very little prospected. With the exception of some ground tried at Tumbarumba by a Mr. Gitchell, a tunnel still driven at Paddy River, 25 miles from Kiandra, and another at Bago, Tumbarumba Road, nothing has been done to test the alluvial strata, which undoubtingly exists in these ancient river beds.

Coming from Tumbarumba, on the main road to Adelong, there are several of these volcanic hills, where the attention of the traveller is drawn to a strange hollow sound under his horse's feet, which is commonly known in these parts as the sounding grounds.

All these volcanic or basaltic hills have the appearance of being auriferous, quartz pebbles, conglomerates, cement, and other indications are strewn about the crowns and sides of these hills. One of these hills, about 2 miles from Watson's, Upper Adelong, bears on its surface very high indications of being auriferous. This hill forms a saddle between the Main and Upper Adelong Creeks, both of which have been rich in gold. As a rule the bottom of these hills is of a very soft granite, therefore not expensive to tunnel.

On Adelong, on the Victoria line of reef, there is nothing fresh to report since my last visit, with the exception that Annett's Company are still sinking and working payable quartz at the depth of about 830 feet from the surface.

The Currajong line of reef still pays, and would pay better could all the gold be extracted from their lode, which is composed of arsenical pyrites, galena, and other minerals, intermixed with quartz. The individual miners having by force of circumstances been driven off the deep lines of reefs, they have lately paid some attention to the Donkey Hill Reef, with favourable results. Hodge Bros., Rogers & Co., Ward and Trudgeon, Parker and Holmes, and Smith and Parker are all on payable stone, averaging from 15 dwts. to 2 ozs. per ton.

Hodgson and Co., and Trudgeon and White are still prospecting on the Caledonian Reef; the latter are on payable gold, but the former are still persevering without payable results. On the old reef the Challenger is on payable quartz; the tributers, after paying a large percentage, are earning about £5 per man per week. Machinery, 12 horse-power engine. The Adelong United is over 700 feet in depth, and has two 12 horse-power engines, one for winding, the other to work the Burleigh rock-drills by compressed air. The drills were tried by Mr. M'Lennan in my presence at the 630 feet level, and with about 45 lbs. of pressure; they average about 24 inches in as many minutes. The air compresser in addition to driving the Burleigh rock-drills is valuable for its introduction of pure air and ventilating the mine.

The Camp Reef is also reworked by a party of miners.

Miners are now scattered, and fresh ground for mining purposes has been taken up at Waldango, Sharp's Creek, and Nacka Nacka. The latter, a distance of about 8 miles N.-W. of Adelong, is now being tried by a party of miners for auriferous quartz veins. They obtained some specimens, and during my visit to the place we crushed and panned about one pound of quartz, which gave a fair prospect of gold. This part of the Adelong District should be prospected by the miners.

The alluvial at Shepardstown gives some fair returns, but the great drawback is the wholesale alienation of auriferous lands on the Lower Adelong Creek.

COAL AND SHALE.

Table compiled from Reports furnished by the Owners of Collieries, showing the quantity and value of Coal and Shale won during the year 1878, and the number of Miners employed in the Collieries.

Company.	Locality.	Miners employed.			Quantity.	Value.			Remarks.
		Above ground.	Under ground.	Total.					
Coal.					Tons.	£	s.	d.	
Australian Agricultural Co.	Newcastle	105	696	801	233,851	147,888	18	6	
Waratah .... South Waratah ...	"	52	196	248	72,064	44,702	0	0	
Newcastle Wallsend...	"	108	490	598	114,908	74,750	0	0	
Co-operative............	"	66	384	450	176,708	98,796	0	0	
Lambton	"	36	400	436	213,332	119,881	4	9	
New Lambton	"	40	256	296	90,811	58,267	0	0	
Duckenfield	"	60	186	246	153,411	100,679	5	0	
Brown's	"	25	166	191					
Newcastle..............	"	25	239	264	73,081	49,528	0	0	
Little Red Head	"	...	...	...	....	....			Not at work.
Red Head..............	"	4	9	13	....	....			Sinking main shaft.
Goose Colliery.........	"	...	3	3	768	500	0	0	
Ferndale	"	19	133	152	44,253	19,839	1	0	
Australasia	"	5	10	15	7,812	5,077	16	0	
Alnwick	"	...	...	...	....	....			Engaged in driving, &c.
Nott, Ward, & Co. ...	Four-mile Ck..	...	...	...	....	....			Not at work.
Sunderland	"	1	3	4	1,850	300	0	0	
Bloomfield	"	1	2	3	1,765	436	10	0	
Jesmond	"	...	...	...	....	....			Not at work.
Anvil Creek	"	...	...	...	....	....			Not at work.
Inganee	"	...	...	...	....	....			Not at work.
Greta Coal and Shale	Maitland	94	155	249	46,382	28,988	0	0	
Stony Creek............	"	1	2	3	174	69	12	0	
Rathluba	"	3	16	19	9,866	4,439	14	0	
Rix's Creek	Singleton	...	...	...	....	....			Not at work.
New Wallsend.........	Catherine Hill Bay	5	...	5	....	....			Not at work.
Mount Wingen	Murrurundi ...	...	...	...	....	....			Not at work.
		650	3,346	3,996	1,241,036	754,143	1	8	
Bulli	Illawarra	90	241	331	124,787	87,315	18	0	
North Bulli	"	...	...	...	....	....			Not at work.
Illawarra	Mount Pleasant	35	101	136	57,623	25,630	17	6	
Osborne, Wallsend ...	Illawarra	42	80	122	40,967	19,114	8	0	
Coal Cliff	"	...	...	73	15,226	9,500	0	0	
Brereton's	Berrima.........	...	...	...	....	....			Not at work.
		...	...	662	238,553	141,561	3	6	
Lithgow Valley	Hartley.........	4	20	24	14,886	4,006	14	7	
Esk Bank...............	"	4	26	30	25,097	7,256	0	0	
Bowenfels...............	"	2	9	11	8,448	2,534	8	0	
Vale of Clwydd	"	7	70	77	46,627	11,135	0	0	
Cooerwell's	"	2	2	4	650	200	0	0	
Noons	Wallerawang...	2	4	6	200	100	0	0	
		21	131	152	95,908	25,232	2	7	
Shale.									
N. S. W. Shale and Oil Co.	Hartley Vale...	30	86	116	18,551	46,377	0	0	
Australian Kerosene Oil & Mineral Co.	Joadja Creek...	6	50	56	5,200	10,400	0	0	
Mount Kembla	Wollongong ...	15	15	30	620	434	0	0	
		51	151	202	24,371	57,211	0	0	

REPORT OF THE EXAMINER OF COAL FIELDS FOR THE COLONY OF NEW SOUTH WALES FOR THE YEAR 1878.

IN accordance with the provisions contained in the 26th section of the "Coal Mines Regulation Act 39 Victoriæ, No. 31," I have the honor to submit a report from the Inspector of Collieries with my general report for the half-year ending 31st December, 1878.

The Inspector's for the half-year ending June 30th last, with my general report for the same period, was transmitted to you on the 9th of August last.

Ventilation.

I am pleased to say there is now the required amount of air circulating through the Greta mine, and that with the exception of the Ferndale Colliery, where the manager is about to erect a furnace, and the Vale of Clwydd Colliery, the provisions of the "Coal Mines Regulation Act," as regards the air circulating through the different mines, are complied with.

Notices of new mines in course of development.

The Redhead Coal-mining Company have lately sunk through a very thick bituminous seam of coal on their large tract of land near Lake Macquarie, and are sinking deeper to prove the other seams of coal known to exist below that they have sunk through.

A company has also been formed at Singleton for working the Rix's Creek seam of coal, and they are supplying the Government with some of it for their locomotives on the Great Northern Railway past Singleton.

The Nattai Coal-mining Company and Campbell Mitchell, Esq., are opening out and developing the seams of coal known to exist on their lands near Nattai, and Messrs. North and others are opening out and proving the seams of coal on their land at Katoomba, adjacent to the Great Western Railway.

The Australian Kerosene Oil Mineral Company, at Joadja Creek, near Berrima, have constructed a tramway from their mine to near the Great Southern Railway, and are actively engaged working the petroleum oil cannel coal, and erecting works for the manufacture of petroleum oil and other products from this rich deposit of boghead cannel coal. 900 tons were lately shipped to Liverpool, England, for the manufacture of gas.

Borings for coal with the diamond rock drill.

I regret to say that after having successfully and expeditiously attained a depth of 1,312 feet the Newington Coal Prospecting Company have been obliged to suspend operations in consequence of some shale passed through caving in and choking the borer at some distance from the bottom of the borehole. It is, I am informed, the intention of the company to either enlarge the borehole or put down another to a depth of about 2,000 feet.

A company has been formed for putting down a borehole to prove coal on the Sutherland Estate, belonging to Thomas Holt, Esq., M.L.C., near Botany Bay, and I am informed that they are now down about 1,320 feet.

A company has also been formed for putting down a deep borehole to test the seams of coal under Moore Park, Sydney, where they have reached a depth of about 200 feet.

I have also the honor to submit the following information in respect to the condition and progress, &c., of the various coal mines of the Colony under my supervision during the year 1878.

Accidents in 1878, *&c.*

The number of fatal and non-fatal accidents I am glad to say is less than it was in 1876. In the year ending December 31st, 1877, there were seven fatal and twenty-one non-fatal accidents. Four of the seven fatal accidents happened from "falls of coal," the fifth from a fall of stone, the sixth through being over-run by a coal-tub, and the seventh through an engine-driver getting his foot caught in a cog-wheel whilst walking across the crank of a winding-engine.

Sixteen of the twenty-one non-fatal accidents occurred from falls of coal, two from being over-run and struck by coal-tubs, and three through being jammed between skips.

In the year just ended there were eight fatal and fifteen non-fatal accidents. A miner named Charles Howard was killed by being crushed between the buffers of two coal-waggons at the Lambton Colliery; an over-man named James Cook was killed through a fall of timber and stone, &c., from the roof of the coal whilst superintending and assisting in retimbering a heading at Brown's Colliery; a labourer named Michael Hannon was run over by coal waggons on the Mount Pleasant Colliery incline plane; a miner named Thomas Jones was killed by a fall of coal at the Bulli Colliery; a miner named John Brown was killed by a fall of coal at the Newcastle Wallsend Colliery; an overseer named Thomas Oswald died from injuries received by stone accidentally falling from the side of an air-shaft in course of sinking at the Coal Cliff Colliery, at the bottom of which he was standing; Mr. Seymour, a colliery manager, was suffocated by foul air through the want of an efficient system of ventilation in the opening out of the Lambton seam of coal at their new pit; and a miner named Robert Brown, who accompanied Mr. Seymour down the pit, was overpowered by foul air, and fell into the sunkhole and was drowned.

Twelve of the fifteen non-fatal accidents occurred from "falls of coal"; the thirteenth happened to an over-man named Michael Avery, who was badly burnt on his hands, face, and thigh by an explosion of cartridges at the Lambton Colliery; the fourteenth to a miner named Matthew Phillipson, who had his leg broken by a fall of stone from the roof of the coal at the Vale of Clwydd Colliery; and the fifteenth to an underground manager named Edward Downey, whose face and hands were burnt by a small explosion of carburetted hydrogen gas at the Greta Colliery.

The number of persons injured and killed by falls of coal and roof is, as usual, very great, and many of these accidents might have been avoided if greater care had been used by the miners in spragging the coal; the danger and risk they run by not doing it is well known to them, but they prefer chancing an accident to taking the necessary precaution of securely spragging or propping the undercut coal.

The Returns which have been collected and forwarded to me by the Mining Department show the following figures for the year 1878:—

Coal Return.

	Northern District.	Southern District.	Western District.	Total.
Tons of round and small coal raised	1,241,036	238,553	95,908	1,575,497
Value of round and small coal raised	£754,143 1s. 3d.	£141,561 3s. 6d.	£25,232 2s. 7d.	£920,936 7s. 4d.
Persons employed above ground......	641; and 9 prospecting, &c.	191	21	853; and 9 prospecting, &c.
Persons employed under ground ...	3,337; and 9 prospecting, &c.	471	131	3,939; and 9 prospecting, &c.

Petroleum Oil, Cannel Coal, and Petroleum Oil Schist Return.

Tons of petroleum oil, cannel coal, and schist raised	24,371
Value of petroleum oil, cannel coal, and schist raised	£57,211
Persons employed above ground	51
Persons employed under ground	151

NORTHERN DISTRICT.

Comparative Statement of Returns for 1877-8.

	Men above ground.	Men under ground.	Tons of round and small Coal raised.	Value.
				£ s. d.
Australian Agricultural Co-operative, Newcastle Wallsend, Waratah, Lambton, New Lambton, Duckenfield, Brown's, Ferndale, Newcastle Coal, Australasia, Greta, Goose, Four-mile Creek, Rix's Creek, and Stony Creek Collieries	641	3,337	1,241,036	754,143 1 3
Total in 1878	641	3,337	1,241,036	754,143 1 3
" 1877	667	3,369	1,151,389	711,172 17 1
Decrease in 1878	26	32	....	....
Increase in 1878	......	......	89,647	42,970 4 2

SOUTHERN DISTRICT.

Comparative Statement of Returns for 1877-8.

	Men above ground.	Men under ground.	Tons of round and small Coal raised.	Value.
				£ s. d.
Bulli, Coal Cliff, Illawarra Coal, and Osborne Wallsend Collieries	191	471	238,553	141,561 3 6
Total in 1878	191	471	238,553	141,561 3 6
" 1877	144	385	216,940	129,163 8 0
Increase in 1878	47	86	21,613	12,397 15 6

THE following Table shows comparisons between the year under notice and the two preceding years as Consumption, total output and value, tons of round and small Coal raised for each person and the quantity of Coal raised per life lost.

Years.	Exports to Intercolonial Ports.			Exports to Foreign Ports.			Total Exports.			Home Consumption.
	Quantity.	Average per ton.	Value.	Quantity.	Average per ton.	Value.	Quantity.	Average per ton.	Value.	
	Tons.	£ s. d.	£	Tons.	£ s. d.	£	Tons.	£ s. d.	£	Tons.
1876	542,952	0 13 8·45	372,045	325,865	0 15 6·45	253,166	868,817	0 14 4·7	625,211	461,101
1877	563,757	0 13 8·64	386,740	351,970	0 14 10·08	282,237	915,727	0 14 2·08	648,977	528,544
1878	623,323	0 13 8·77	427,954	383,097	0 14 7·72	280,452	1,006,420	0 14 0·93	708,406	569,077
Total	1,730,032	0 13 8·74	1,186,739	1,060,932	0 15 4·54	815,855	2,790,964	0 14 2·48	1,982,594	1,548,722

WESTERN DISTRICT.

Comparative Statement of Returns for 1877-8.

	Men above ground.	Men under ground.	Tons of round and small Coal raised.	Value. £ s. d.
Esk-bank, Lithgow Valley, Vale of Clwydd, Bowenfels, Coerwell, and Noons Collieries	21	131	95,908	25,232 2 7
Total in 1878	21	131	95,908	25,232 2 7
" 1877	15	77	75,942	18,662 3 1
Increase in 1878	6	54	19,966	6,569 19 6

From these returns we find that, notwithstanding the continued general depression during the past year in the coal, iron, and other trades throughout Great Britain and other countries, our coal trade shows a steady increase in every district of this Colony.

The greatest increased yield and value is in the Northern District (89,647 tons, valued at £42,970 4s. 2d.), and the next largest in the Southern (21,613 tons, valued at £12,397 15s. 6d.), the Western increase being 19,966 tons, valued at £6,569 19s. 6d.

regards the Exports of Coal to Foreign and Intercolonial Ports, the quantity used for Home employed in and about the Collieries, value of round and small Coal raised for each person so employed,

Total Output and Value.			Coal raised per each person employed in and about the Mines.			Value of Coal raised per each person employed in and about the Mines.			Tons of Coal raised per life lost.		
Quantity.	Average per ton.	Value.	Quantity.	Average tons per each person employed.	Persons employed.	Value.	Average value per each person employed.	Persons employed.	Quantity.	Average tons per each life lost.	Lives lost.
Tons.	£ s. d.	£ s. d.	Tons.	Tons.	Number	£	£ s. d.	Number	Tons.	Tons.	Number
1,319,918	0 12 2·06	803,300 5 6	1,319,918	323	4,084	803,300	196 13 8	4,084	1,319,918	329,979	4
1,444,271	0 11 10·74	858,998 8 2	1,444,271	310	4,657	858,999	184 9 0	4,657	1,444,271	206,324	7
1,575,497	0 11 8·28	920,936 7 4	1,575,497	328	4,792	920,936	192 3 8	4,792	1,575,497	196,937	8
4,339,686	0 11 10·86	2,583,235 1 0	4,339,686	320	13,533	2,583,235	190 17 8	13,533	4,339,686	228,404	19

T

From the above we find that in the year 1878 we exported 59,566 tons more coal to intercolonial ports than in the preceding year, and 31,127 tons more to foreign ports, whilst our total exports exceeded those of 1877 by 90,693 tons, and the home consumption by 40,533. The total output of coal for the last year exceeded that of 1877 by 131,226 tons. It will also be seen that the quantity of coal raised during the last three years for each person employed in above and underground work at the collieries has averaged 320 tons of round and small coal per year, and that each person so employed added £190 17s. 8d. per annum to the wealth of the Colony.

In these years 1876, '77, and '78 nineteen lives were lost for 4,339,686 tons of coal raised—that is, 228,404 tons for each life lost; whilst in Great Britiain, in the years 1875, '76, and '77, 3,385 lives were lost for 399,391,839 tons of coal raised, that is, 117,988 tons for each life lost. Considering we have no large quantities of explosive gas to contend with in our coal mines, and are at present exempt from those fearful explosions attended with great loss of life, I think the accidents are greater in proportion to the quantity of coal raised than they ought to be if more care was exercised by the miners in propping and spragging the coal, &c.

These figures appear to me to be sufficiently explanatory in themselves, so far as a comparison of our export trade and home consumption, &c., for the whole Colony is concerned; but I again think it may also be interesting for each district to know the proportion the accidents and deaths bear to the persons employed, and the quantity and value of coal raised for each person employed in and about the mines, &c., which is as follows :—

NORTHERN DISTRICT.

Number of persons employed in and about the mines	3,978
Number of persons employed underground	3,337
Quantity of coal raised, in tons	1,241,036
Number of non-fatal accidents	10
Number of lives lost by accidents...	5
Persons employed for each non-fatal accident	398
Persons employed for each life lost	796
Tons of round and small coal raised per each non-fatal accident	124,103
Tons of round and small coal raised per life lost	248,207
Tons of coal raised per each person employed in and about the mines ...	312
Tons of coal raised per each person employed underground	372

	£	s.	d.
Value of coal raised	754,143	1	3
Value of coal raised per each person employed in and about the mines ...	189	11	6
Value of coal raised per each person employed underground	225	19	10

SOUTHERN DISTRICT.

Number of persons employed in and about the mines	662
Number of persons employed underground...	471
Quantity of coal raised, in tons	238,553
Number of non-fatal accidents	3
Number of lives lost by accidents	3
Persons employed per each non-fatal accident	221
Persons employed for each life lost	221
Tons of coal raised for each non-fatal accident	79,518
Tons of coal raised per life lost	79,518
Tons of coal raised per each person employed in and about the mines ...	360
Tons of coal raised per each person employed underground	506

	£	s.	d.
Value of coal raised	141,561	3	6
Value of coal raised per each person employed in and about the mines ...	213	16	9
Value of coal raised per each person employed underground	300	11	1

WESTERN DISTRICT.

Number of persons employed in and about the mines	152
Number of persons employed underground	131
Quantity of coal raised, in tons	95,908
Number of non-fatal accidents	2
Number of lives lost by accident	nil
Persons employed for each non-fatal accident	76
Persons employed for each life lost	no life lost
Tons of round and small coal raised per each non-fatal accidents	47,954
Tons of round and small coal raised per life lost	no life lost
Tons of coal raised per each person employed in and about the mines ...	631
Tons of coal raised per each person employed underground	732
	£ s. d.
Value of coal raised	25,232 2 7
Value of coal raised per each person employed in about the mines	166 0 0
Value of coal raised per each person employed underground	192 12 2

The following Table shows comparisons between the year under notice and the preceding year as regards the proportion the accidents and deaths bear to the persons employed, the quantity and value of coal raised for each person employed in and about the mines and underground, in the Northern, Southern, and Western Districts :—

	Northern District.		Southern District.		Western District.	
	1877.	1878.	1877.	1878.	1877.	1878.
Number of persons employed in and about the mines.	4,036	3,978	529	662	92	152
Number of persons employed underground	3,369	3,337	385	471	77	131
Quantity of coal raised, in tons	1,151,389	1,241,086	216,940	238,553	75,942	95,908
Number of non-fatal accidents	19	10	3	3	nil	2
Number of lives lost by accident	7	5	nil	3	nil	nil
Persons employed for each non-fatal accident.	212	398	176	221	no accidents	76
Persons employed for each life lost	576	796	no life lost	221	no life lost	no life lost
Tons of round and small coal raised per each non-fatal accident.	60,599	124,103	72,313	79,518	no accidents	47,954
Tons of round and small coal raised per life lost.	164,484	248,207	no life lost	79,518	no life lost	no life lost
Tons of coal raised for each person employed in and about the mines.	285	312	410	360	825	631
Tons of coal raised for each person employed underground.	341	372	563	506	986	732
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Value of coal raised......................	711,172 17 0	754,143 1 3	129,163 8 0	141,561 3 6	18,662 3 1	25,232 2 7
Value of coal raised per each person employed in and about the mines.	176 3 0	189 11 6	244 3 3	213 16 9	202 17 0	166 0 0
Value of coal raised per each person employed underground.	211 1 0	225 19 10	235 9 8	300 11 1	242 7 3	192 12 2

The following Statistical Return furnished me by Mr. Logan, the Collector of Customs at Newcastle, shows the greatest yearly increase in the export of coal from this port has been—To New Zealand, 32,461 tons; India, 28,713 tons; Japan, 15,980 tons; Victoria, 13,723 tons; South Australia, 10,016 tons; Manila, 3,260 tons; Hongkong, 2,329 tons. And the greatest decreases have been—To China, 12,408 tons; Java, 4,228 tons; and San Francisco, 2,846 tons.

New South Wales—Port of Newcastle—Export of Coal.

To Foreign and Intercolonial Ports.	1877.	1878.	Increase.	Decrease.	Total increase for 1878.
	Tons.	Tons.	Tons.	Tons.	Tons.
Victoria	274,943	288,666	13,723	....	....
New Zealand	149,363	181,824	32,461	....	....
South Australia	80,331	90,347	10,016	....	....
Tasmania	18,706	18,510	....	196	....
Queensland	7,039	8,402	1,363	....	....
West Australia	311	....	....	311	....
Fiji	....	500	500	....	....
New Caledonia	1,047	3,366	2,319	....	....
India	22,830	51,543	28,713	....	....
United States	750	1,255	505	....	....
San Francisco	83,557	80,711	....	2,846	....
Hongkong	69,595	71,924	2,329	....	....
China	23,058	10,650	....	12,408	....
Mauritius	2,901	1,607	....	1,294	....
Japan	14,166	30,146	15,980	....	....
Manila	12,831	16,091	3,260	....	....
Valparaiso	2,865	586	....	2,279	....
Honolulu	1,997	3,586	1,589	....	....
Java	11,454	7,226	....	4,228	....
Bankok	1,000	....	....	1,000	....
Guam	642	....	....	642	....
Petropaulovsk	2,116	2,350	234	....	....
Cebu	....	270	270	....	....
Tahiti	....	2,425	2,425	....	....
	781,502	871,985	115,687	225,204	90,483
Coastwise	258,934	276,201	17,267	....	17,267

DECENNIAL RETURN—Port of Newcastle—Foreign, Intercolonial, and Coastwise Trade.

Year.	Entered inwards from Foreign and Intercolonial Ports.		Cleared outwards for Foreign and Intercolonial Ports.		Total value of Imports from Foreign and Intercolonial Ports.			Quantity and value of Coal exported to Foreign and Intercolonial Ports.				Total value of Exports (including Coal) to Foreign and Intercolonial Ports.			Total amount of Revenue Collected.		
	No. of vessels.	Tonnage.	No. of vessels.	Tonnage.				Tons.	Value.								
					£	s.	d.		£	s.	d.	£	s.	d.	£	s.	d.
1869	854	297,855	1,084	386,176	151,410	4	5	503,866	223,566	4	2	252,124	3	6	33,058	0	5
1870	765	283,091	1,046	383,242	154,816	5	8	511,545	223,077	7	0	241,435	16	8	32,145	5	7
1871	745	277,959	1,040	376,378	203,168	2	7	489,714	208,833	9	0	236,683	9	3	26,590	1	9
1872	876	342,514	1,092	427,845	268,141	12	11	565,994	243,911	18	0	282,834	9	10	41,196	9	8
1873	978	389,121	1,259	498,468	310,101	11	11	650,899	412,631	5	9	591,032	6	6	48,864	16	8
1874	1,156	510,291	1,269	543,693	343,297	19	11	723,844	496,448	15	0	697,048	7	7	59,387	7	11
1875	1,162	510,902	1,341	573,826	480,771	19	6	771,144	527,949	12	10	644,615	0	6	60,818	4	3
1876	1,023	433,423	1,309	535,738	469,988	2	8	719,050	495,502	0	0	585,114	16	2	54,031	8	0
1877	1,065	469,348	1,328	577,376	502,861	6	4	781,502	540,560	0	0	680,750	11	7	56,584	3	11
1878	1,153	542,745	1,407	655,885	444,760	18	9	871,985	602,557	0	0	699,252	13	0	60,511	14	0

N.B.—The quantity of coal shipped coastwise from 1869 to 1878 inclusive was 2,369,539 tons.

Return showing the price per ton, value, and quantity of Coal raised from 1829 to 1878 inclusive.

Coal.								Coal.							
Year.	Tons.	Average price per ton.			Value.			Year.	Tons.	Average price per ton.			Value.		
		£	s.	d.	£	s.	d.			£	s.	d.	£	s.	d.
1829	780	0	10	1·23	394	0	0	1855	137,076	0	12	11·96	89,082	0	0
1830	4,000	0	9	0·00	1,800	0	0	1856	189,960	0	12	4·96	117,906	0	0
1831	5,000	0	8	0·00	2.000	0	0	1857	210,434	0	14	0·97	148,158	0	0
1832	6,000	0	7	0·00	2,100	0	0	1858	216,397	6	14	11·84	162,162	0	0
1833	328	0	7	6·73	124	0	0	1859	308,213	0	13	3·14	204,371	0	0
1834	8,490	0	8	10·00	3,750	0	0	1860	368,862	0	13	3·36	226,493	0	0
1835	12,392	0	8	10·19	5,483	0	0	1861	342,067	0	12	9·52	218,820	0	0
1836	12,646	0	9	1·06	5,747	0	0	1862	476,522	0	12	9·73	305,234	0	0
1837	16,083	0	9	8·81	7,828	0	0	1863	433,889	0	10	10 66	236,230	0	0
1838	17,220	0	9	9·05	8,399	0	0	1864	549,012	0	9	10·10	270,171	0	0
1839	21,283	0	9	9·73	10,441	0	0	1865	585,525	0	9	4·43	274,303	0	0
1840	30,256	0	10	10·86	16.498	0	0	1866	774,238	0	8	4·44	324,049	0	0
1841	34,841	0	12	0·00	20,905	0	0	1867	770,012	0	8	10·79	342,655	0	0
1842	39,900	0	12	0 00	23,940	0	0	1868	954,231	0	8	9·08	417,809	0	0
1843	25,862	0	12	6·54	16,222	0	0	1869	919,774	0	7	6·32	346,146	0	0
1844	23,118	0	10	8·34	12,363	0	0	1870	868,564	0	7	3·54	316,836	0	0
1845	22,324	0	7	10·27	8,769	0	0	1871	898,784	0	7	0·47	316,340	0	0
1846	38,965	0	7	0·46	13,714	0	0	1872	1,012,426	0	7	9·92	396,198	0	0
1847	40,732	0	6	9·01	13,750	0	0	1873	1,192,862	0	11	1·94	665,747	0	0
1848	45,447	0	6	3·38	14,275	0	0	1874	1,304,567	0	12	1·37	790,224	0	0
1849	48,516	0	6	0·45	14,647	0	0	1875	1,329,729	0	12	3·89	819,429	17	2
1850	71,216	0	6	6·77	23,375	0	0	1876	1,319,918	0	12	2·06	803,300	5	6
1851	67,610	0	7	6·51	25,546	0	0	1877	1,444,271	0	11	10·74	858,998	8	2
1852	67,404	0	10	11·33	36,885	0	0	1878	1,575,497	0	11	8·28	920,936	7	4
1853	96,809	0	16	1·51	78,059	0	0								
1854	116,642	1	0	5·63	119,380	0	0	Total	19,056,694	0	10	6·67	10,057,992	18	2

N.B.—From the above we find that the quantity of coal raised in the year 1878 exceeded that of 1868 by 621,266 tons; the year 1868 that of 1858 by 737,834 tons; the year 1858 that of 1848 by 170,950 tons; the year 1848 that of 1838 by 28,227 tons; and that the total quantity of coal raised in the Colony to the 31st December last was 19,056,694 tons, valued at £10,057,992 18s. 2d.

Return showing the quantity raised, price per ton, and value of Petroleum Oil (cannel coal), commonly called Kerosene Shale, and Petroleum Oil Schist, from 1865 to 1878 inclusive.

Year.	Tons.	Average price per ton.			Value.			Year.	Tons.	Average price per ton.			Value.		
		£	s.	d.	£	s.	d.			£	s.	d.	£	s.	d.
1865	570	4	2	5·47	2,350	0	0	1873	17,850	2	16	6·55	50,475	0	0
1866	2,770	2	18	10·48	8,154	0	0	1874	12,100	2	5	1·48	27,300	0	0
1867	4,079	3	14	9·21	15,249	0	0	1875	6,197	2	10	2·22	15,500	0	0
1868	16,952	2	17	7 11	48,816	0	0	1876	15,998	3	0	0·00	47,994	0	0
1869	7,500	2	10	0·00	18,750	0	0	1877	18,963	2	9	0·82	46,524	10	0
1870	8,580	3	4	3·18	27,570	0	0	1878	24,371	2	6	11·49	57,211	0	0
1871	14,700	2	6	3·91	34,050	0	0								
1872	11,040	2	11	11·91	28,700	0	0	Total	161,670	2	13	0·32	428,643	10	0

In conclusion, I have only to state that there were thirty-three collieries under inspection against thirty-seven in the preceding year, and that the returns show a steady and gradual increase in the output of coal from the Northern, Southern, and Western coal-fields.

I have, &c.,
JOHN MACKENZIE, F.G.S.,
Government Examiner of Coal-fields.

THE HALF-YEARLY REPORT of the Inspector of Collieries on the state of the Collieries in the various Districts in New South Wales, and Accidents therein, for the half-year ended 31st December, 1878.

The Examiner of Coal Fields, Newcastle,—

Sir,

Lambton, 10 January, 1879.

Pursuant to clause 26 in the "Coal Mines Regulation Act, 1876," I have the honor to transmit to you this my Six-monthly Report on the state of the collieries under inspection in the various districts during the half-year ended 31st December, 1878.

The number of collieries under inspection during the half-year is less by three than for the first half of the year, viz., one small coal and one kerosene shale mine stopped in the Southern District, known as American Creek Mines, and one small coal mine in the Northern District known as Nott and Ward's Mine.

Mines at work during the half-year:—

Northern District	21	coal mines.			
Southern „	4	„			
Western „	5	„	and 1	shale mine.	
Berrima „	...	„	2	„	
	30	„	„ 3	=	33 mines.

The Nattai Creek Coal Company lately formed are pushing on preliminary works for developing their coal property a few miles from Nattai.

PRESENT STATE OF THE COLLIERIES.

I think it my duty to repeat herein the statement made in my previous half-yearly report, viz., the minimum quantity of ventilation required by the Coal Mines Act, 1876, for all men and horses employed in the mines is still introduced, except in a few instances, notwithstanding the prevailing system of double-shift working, and that the general provisions of the law are fairly carried out with but few exceptions.

A. A. Company.—The quantity of ventilation introduced into the mine is about 85,000 cubic feet per minute, for about 690 men and horses employed therein on the day shift. The other provisions of the Act were fairly complied with during the half-year. However the distribution of the air in some parts of the mine has been complained of lately.

N.C.M. Company.—About 55,000 cubic feet of air per minute is introduced into the mine, for about 250 men, &c., employed therein. In other respects also the provisions of the Act are complied with.

Waratah.—The provisions of the Act are fully complied with. Miners employed removing pillars, &c.

New Lambton.—About 30,000 cubic feet of air per minute is introduced into the mine for about 250 men, &c., employed therein. The other provisions of the Act are complied with also.

Ferndale.—About 120 men and horses employed in the mine, and about 8,000 cubic feet of air per minute introduced into the mine, which is considerably below the minimum quantity required by the Act. The air currents are not properly circulated through the workings, &c., the ventilation arrangements being still in an incomplete state.

Lambton.—About 100,000 cubic feet of air per minute is introduced into the mine for about 450 men and horses employed therein. The provisions of the Act are complied with in other respects also.

Wallsend.—About 50,000 cubic feet of air per minute is sent into the B pit for about 260 men, &c., employed therein, and about 25,000 cubic feet per minute into the new tunnel for about 200 men, &c., employed therein. The provisions of the Act are carried out in other respects also.

Co-operative.—About 40,000 cubic feet of air per minute is introduced into the new tunnel for about 340 men, &c., employed therein; and about 20,000 cubic feet per minute into the old tunnel for about 25 men, &c., employed. No complaints.

Duckenfield.—About 25,000 cubic feet per minute of air is introduced into the mine for about 220 men, &c., employed. The other provisions of the Act are complied with also.

Brown's Colliery.—About 23,000 cubic feet of air per minute is sent into the mine for about 160 men, &c., employed therein. No complaints.

Alnwick.—About fifteen men, &c., employed re-opening, &c. No complaints.

Rathluba.—About twenty-three men, &c., employed. Ventilation fair, but could not measure it. No complaints.

Tulip's Pit.—Only three miners employed, getting house coal. No complaints.

Mitchell's Pit.—Only two or three miners employed, getting house coal. No complaints.

Bloomfield.—Only two miners employed, getting house coal, &c. No complaints.

Anvil Creek.—Old pit closed. Just started opening a new tunnel. No complaints.

Greta.—Trade being irregular, the number of miners employed in the mine fluctuated considerably in consequence. About 100 men, &c., on average; and about 12,000 cubic feet of air per minute introduced into the mine. No complaints.

Rix's Creek.—Only a few tons of coal per week. Worked by the lessee himself. However a company is about to be formed to work the mine more extensively in future. No complaints.

Raspberry Gully.—About 45,000 cubic feet of air per minute is introduced into the mine for about 180 men, &c., employed therein. No complaints.

Australasia.—About fifty-five men, &c., employed in the mine, ventilation being by means of several openings to the day is in a fair state, but could not be taken with the instrument. No complaints.

Bulli Colliery.—About 23,000 cubic feet of air per minute is introduced into the mine for about 210 men, &c., employed therein. No complaints. The new tunnel is being pushed on, &c.

Osborne Wallsend.—About 10,000 cubic feet of air per minute is introduced into the mine for about seventy-eight men, &c., employed therein. No complaints.

Mount Pleasant.—About 9,000 cubic feet of air per minute is introduced into the mine for about ninety-seven men, &c., employed therein. It will be seen from the above figures that the quantity of air is rather below the minimum required by the Act. However only about half the miners are in the mine together, excepting a few hours when they change shifts. The miners are not yet paid by weight for the coal they get.

Coal Cliff.—About forty-five men, &c., are now employed in the mine. The ventilation is much improved, but the furnace and other works not being completed the quantity of air could not be ascertained. The miners are not yet paid by weight for the coal they get.

Eskbank.—About 3,000 cubic feet of air per minute is introduced into the mine for about twenty-four men, &c., employed therein. No complaints.

Vale of Clwydd.—Ventilation still very defective, notwithstanding repeated complaints made by myself to the manager of the matter. The fire-lamp having lately been removed from under the upcart shaft, there was no artificial means used for creating ventilation, when I visited the mine in December last. The miners are not yet paid by weight for the coal they get.

Bowenfels.—About ten men, &c., employed in the mine. The ventilation is good but could scarcely be measured owing to the large area of the airways. The miners are not yet paid by weight for the coal they get.

Lithgow Valley.—About sixteen men, &c., employed in the mine, and about 3,000 cubic feet of air per minute sent into the mine. The circulation of the air is still rather defective. No other complaints.

Cooerwell.—Only one miner, partly employed, getting a few tons of coal per week.

Hartley Shale.—About 12,000 cubic feet of air per minute sent into the mine for about eighty-eight men, &c., employed therein. No complaints.

Australian Shale.—About thirty-two men employed in the various tunnels, and the ventilation is good throughout, although it could not well be measured, &c. No complaints.

Carter's Shale.—The mine was lately sold to the Australian Shale Company, and the men, &c., transferred to the other mine.

Accidents in Mines.

Only two accidents, resulting in serious bodily injury to two persons, have been reported by me during the six months, which happened as follows:—One in the Bulli Colliery, and one in the Newcastle C. M. Company's Colliery. The one in the Bulli Colliery was a collar-bone fracture by a fall of coal; and the one in the N. C. M. Company's pit was a severe crushing of the foot, also by a fall of coal. In neither case were the colliery officials to blame, &c.

I also investigated several lighter accidents.

I hereto append the usual list of accidents.

I have, &c.,
THOMAS LEWIS,
Inspector of Collieries.

A Tabulated List of non-fatal accidents investigated by the Inspector of Collieries in New South Wales, during the six months ended 31st December, 1878.

No.	Date.	Colliery.	Sufferer.	Occupation.	Remarks on nature and extent of injuries.	Falls of Coal.	Total Non-fatals.
1	July 15	Bulli	James Hasson	Road-man.	Collar-bone fractured by fall of coal.	1	1
2	Sept. 12	N. C. M. Comy...	Matthew Lowdon...	Miner ...	Foot severely crushed	1	1
					Totals	2	2

REPORT OF THE GEOLOGICAL SURVEYOR IN CHARGE

FOR THE COLONY OF NEW SOUTH WALES FOR THE YEAR 1878.

During the early part of the year I was chiefly engaged upon official work in the Department, and also in connection with the Exhibition Commission in preparing for the representation of the mineral resources of New South Wales at the Universal Exposition of Paris.

At the end of 1877 I reported upon the first discovery of gold in New Guinea made by Mr. Andrew Goldie. On 7th January, 1878, the Rev. Mr. Lawes, missionary from New Guinea, left with me for examination the samples of rocks and river sand which he had collected from near Port Moresby. The evidence which these samples afford of auriferous formation confirms Mr. Goldie's first discovery of alluvial gold in New Guinea. The samples of gold and rocks obtained by Mr. Goldie and the Rev. Mr. Lawes are now in the Museum of the Department of Mines, Sydney. A description of these samples is herewith appended. (See Appendix A.)

In April I accompanied Mr. P. F. Adams, the Surveyor General, to the Fish River Caves, for the purpose of making an examination and survey of those vast limestone caverns. My report thereon, and that of Mr. Lamont Young, F.G.S., Geological Surveyor, you have already received. It is of urgent importance that the recommendation of Mr. Adams in his report to the Minister for Lands, regarding the preservation of the caves, should be carried out.

In June, according to instructions, I examined the coal lands of Messrs. Garrett and Griffiths, on the Sugarloaf Range, at Teralba. The geological features of this locality I have already described in my Progress Report for the year 1877.

Accompanied by Mr. Lamont Young, I inspected several of the Western Gold-fields in reference to the alienation of auriferous lands. The results of our examination in dealing with special instructions have been from time to time communicated to the Under Secretary for Mines, certain areas being recommended to be thrown open to conditional purchase, and others to be reserved on account of gold-mining. But apart from the inspection of auriferous lands applied for to be alienated for sale, the principal geological features of the country traversed have been observed; to these I will now refer.

Immediately north of the village of Perth, near Bathurst, are some table-topped hills—the "Bald Hills"—capped with basalt. The basalt rests on a very silicious tertiary pebble conglomerate, which in turn rests upon granite. Previous to the flow of the basalt the tertiary conglomerate is seen to have been extensively denuded. This fact proves the latter rock to be older than the upper pliocene leads or river channels which the lava flowed into and buried while large trees and other vegetation were growing upon their banks, as may be witnessed in the old buried river channel, whose banks were formed of a similarly denuded older tertiary drift at the Swallow's Nest Diggings, higher up the valley, on Campbell's River, and which I described in my report for 1877. I believe that this basalt is an outlier or remnant of the basaltic stream which in pliocene times flowed down Campbell's River Valley from near Swatchfield. The basalt is in places very columnar, and on the Bald Hills this columnar structure is splendidly shown, the five and six sided columns being of considerable length and well formed; sometimes they are curved in a remarkable manner. They are easily quarried, and those of regular shape are used without dressing for curb-stones in the streets of Bathurst. The basalt also makes excellent road metal. I obtained several good specimens of the columns for the Museum of Mines.

From Trunkey, along the road to Blayney, the formation consists of silurian with quartz reefs as far as the village reserve on Coombing Creek, where hornblendic granite occurs; thence to Blayney we have metamorphosed silurian rock, with masses of greenstone diorite appearing at intervals. The whole of this country is of a more or less auriferous character, and payable deposits will probably be discovered when it is more closely examined, especially beneath the deep alluvium in the valley which drains from the country occupied by the King's Plains and Dungeon Diggings, where the gold found in the shallow alluvial workings has evidently been derived from the diorite and silurian rocks. The same metamorphosed silurian formation with diorite and greenstone porphyry extends from Blayney westward to near Cowra, or along the Bellubula River to Canowindra, except that at Carcoar granite comes in; and in the Bellubula valley from Carcoar downwards we meet with occasional outliers of pliocene tertiary drift overlaid by basalt—remnants of the ancient river channel that formerly drained this valley. In places this drift has been worked *in situ* under the basalt, but where removed by denudation it has gone to form newer deposits, which, containing also the gold derived from the further degradation of the diorite and silurian, have afforded rich alluvial workings on the points of the spurs and in the more recent alluvial flats along the Bellubula River. There is a small alluvial deposit being worked for gold in Golden Gully, on the Coombing Estate, the property of T. Icely, Esq. These and other workings are evidence of the existence of auriferous reefs in this district not yet discovered.

Several reefs are being worked at Gully Swamp, about 9 miles south from Carcoar; they are in slate formation near diorite. Mr. Thos. Lane kindly furnished me with the following returns of crushing from some of these reefs:—From Lane's Reef, 125 tons yielded 296 ozs., or at the rate of 2 ozs. 7 dwts. 8 grs. per ton; from the Perseverance Reef, 590 tons yielded 352 ozs., or at the rate of 11 dwts. 22 grs. per ton. Several other parcels, amounting to 106 tons, yielded 142·36 of gold, or, after melting, the Mint returns gave 140·5 ozs., the proportion of gold and silver in 100 parts being 86·55 and 10·25 respectively.

The eastern portion of this gold-field embraces some excellent agricultural land, which I recommended to be thrown open to conditional purchase under the 14th section.

Near Euroka, and on the south bank of the Bellubula River, are the so-called "Junction Reefs," which have been extensively worked, but are now idle. They are not actual reefs, but are true *beds* of a ferruginous and silicious character, intercalated with the silurian strata, which have been much disturbed and tilted at varying angles from horizontal to nearly vertical, and are intersected by dykes of greenstone. Within a thickness of 100 feet of strata six of these auriferous beds, from 2 to 4 feet thick each, have been opened and more or less worked; these, in my opinion, deserve further attention.

The formation of the country from Carcoar to near Cowra consists of altered silurian schists with intrusions of diorite and felspar porphyry, all of an auriferous character. At Cowra porphyritic granite occurs.

About 10 miles north-east from Cowra are the Wood's Flat Diggings, where a broad mass of greenstone runs through the silurian schists in a northerly direction. Several reefs have been worked in the greenstone. A pliocene tertiary lead has also been worked for a length of about 1½ mile, yielding from 10 dwts. to 1½ oz. of gold to the load. At the head of the lead several nuggets weighing from 30 to 79 ozs. have been found, and near this place some lodes of ironstone occur in the slate, nor far from the greenstone. It was supposed that the lead at the lower end continued to follow down the present valley towards the Wangoola Creek, but a high bar of rock was found to prevent its taking that course, and, chiefly owing to the scarcity of water, further prospecting was discontinued. After examination of the ground, I am of opinion that the lead passes in a northerly direction into the Noyeau Valley and towards the Sheet-o'-Bark Creek. As the formations along this course are of an auriferous character, it is highly probable that when the lead is again found it will prove payable for a large number of miners. This locality is now being tested by M'Donald and Howie's party, assisted by the Government, and a party sent out by the Cowra Prospecting Association. Small irregular veins of copper ore have been found here at the Belmore Copper Mine in greenstone, at its junction with the silurian.

Seven miles from Cowra, in a northerly direction, a little gold was found in a gully on the western slope of the Wallaroo Range, where some small quartz veins are seen traversing hornblendic granite. I do not think that any payable reefs will be found here. The granite extends to within 4 miles from Canowindra, where we meet with metamorphosed granitoid schists containing double hexagonal crystals of quartz.

Several reefs near Canowindra—the Blue Jacket, &c.—have been worked for a consider, able depth, when they were abandoned. It is near these reefs where a prospecting party-aided by the Government, purposes trying for a deep lead in one of the valleys which fall into the Bellubula.

About 5 miles west from Canowindra we lose the silurian schists and come upon fine-grained silicious sandstones of a purple colour, and striking N. 20 W. with dip vertical; but 3 miles further west we find the same sandstones with purplish shales or mudstones, dipping W. 10 S. at 14. These contain fine impressions of *lepidodendron* (two species), together with *sigillaria* and other plant impressions, and a small bivalve shell. The rocks are probably of upper devonian age. At Pye's Gap, on the main road, occur similar beds, forming a synclinal axis, the strike of which runs north and south. About 1½ mile west from this point we find granite, which extends to Eugowra; thence along the road to Forbes, for the first 6 miles, the formation is of the same granite, succeeded for 1 mile by alluvium and rounded quartz pebble drift, which is probable indicative of an auriferous deep lead running southerly into the Lachlan Valley; thence to Forbes we pass over altered silurian sandstones and shales, covered in places by the red loamy pleistocene deposits, which form those wide-spread alluvial flats through which the Lachlan River flows. About 10 miles west of Forbes occur metamorphosed sandstones and shales, with beds of marble limestone. In the latter we observed *rhynchonella*, *crinoids*, several species of *favosites*, and a *halysites*; the presence of this latter genus proves the upper silurian age of these beds. Nearer Forbes, Mr. Warden Dalton showed us the Rocky Lead, where some shafts have been sunk in a hard silurian conglomerate, the waterworn pebbles in which have evidently led miners to prospect the conglomerate, believing it to be a tertiary cement: but the fossils in it indicate its age, and that there is no possibility of finding payable alluvial gold in it.

The geology of the Forbes, Parkes, Grenfell, and Young Districts have been already described in my former annual reports.

In August the Prospecting Board, consisting of the Under Secretary for Mines, the Wardens of the Gold-fields, and myself, commenced to investigate the claims of applicants for aid from the £5,000 voted by Parliament for assisting in prospecting for gold. We first visited Young, where a Company has been formed for working the alluvial flats below the town. There is little doubt but that much of the auriferous ground known as the Lambing Flat Diggings, which was abandoned owing to the difficulty of working it in the early days of the gold-fields, may, with the advantages and appliances in mining now to be obtained, be worked with profit. We next proceeded to Grenfell, which is situated on the margin of a large tract of auriferous country extending to the north, east, and south from the town. It is proposed to prospect the gullies near the Tin-pot Reefs, on the watershed to the Lachlan. The Grenfell Prospecting Association also applied for aid to prospect the deep alluvium in the Tyagong Valley. There can be no question that a deep lead exists in this valley, and as it drains country intersected by auriferous reefs we may anticipate that it will prove payable. The Seven-mile and other rich leads already worked are tributaries to the undiscovered main lead. There were applicants for prospecting in the Billabong and Lachlan Gold-fields, at the Pinnacle, at Forbes, at several places between Forbes and Parkes, and for 30 miles north of Parkes. This is all very promising auriferous country. The gullies draining from the Pinnacle Reefs are the sources of old watercourses that once emptied into the Lachlan Valley, but are now deeply buried beneath the vast pleistocene alluvial plains. At Forbes it is proposed to search for the continuation of the South Lead. I believe rich deposits will yet be found on the east side of and near the southerly extension of that greenstone dyke which is the chief source of the gold found in the rich leads at Forbes. This greenstone continues in a northerly direction through Parkes, and has fed the Tichbourne, Wapping Butcher, M'Guiggan's, Welcome, Bushman's, and other leads. In the same line of country there must be more similar leads not yet discovered, which should be searched for, especially about that part of the Scrubby Plains lying to the east and south-east of the hill at the head of the Tichbourne Lead. This hill is on the watershed from which, in pliocene tertiary times, the Wapping Butcher and Tichbourne Leads were the old watercourses flowing to the north-west; while the drainage channels on the eastern falls of this watershed have not yet been found. The Bushman's and Welcome Leads, near Parkes, also deserve further attention. They both drain into the valley of the Goobang Creek. The course of the former was supposed to turn in a northerly direction, where it is called the North Lead, and run up the Goobang Valley; but on examination of the ground, and by levelling, I ascertained that this Northern Lead must be a tributary of the Bushman's, and that the latter must turn near where it crosses the present creek, and continues in a south-easterly direction, where search should be made either by boring or sinking. I visited these localities in company with the Under Secretary for Mines. Mr. Warden Dalton also entertains a high opinion of their prospects.

The Parkes Prospecting Association not consenting to the terms upon which the Government aid could be granted them declined to avail themselves of it. They purposed prospecting the country about 20 miles north from Parkes.

The Cargo Gold-field was next visited. Here application had been made by the local Association for prospecting on Gum Flat, where several small leads have been traced into ground over 300 feet deep, in which the main gutter has not yet been struck. One shaft—Hodge and party's—is 340 feet deep. The formation of this country is remarkable. Gum Flat lies in a valley, with hills of silurian schists on either side, intersected by dykes of porphyritic diorite and quartz reeefs. On the range to the east, and near the town of Cargo, several rich pyritous reefs—the Ironclad Reef, &c.—have been worked. These reefs have fed the above-mentioned leads. At Gum Flat there are three formations of gold drifts. The lowest consists of very waterworn quartz pebble drift and red ferruginous sandy clays, forming a false bottom to the next or pliocene drift, from which the gold has hitherto been obtained, and which, like the leads at Gulgong, contain fossil plants. Above this are the pleistocene gravels and clays, which are only payable in the shallower ground in the gullies between the hills. We may therefore expect to find here two sets of deep leads, the upper one of which, with the black clays and fossil leaves, will be found resting in places on the older rounded quartz pebble drift, and this latter will rest on silurian schists and limestones. An almost vertical vein of alluvial wash has been followed to a considerable depth. The unusual position of such wash induced some persons to regard the so-called vein as a fissure leading to some subterranean passage in the limestone beneath the older drift; but I rather regard this wash not as having filled up a fissure, but as having been the surfacing on the side of the valley in the pliocene times, and before the valley was filled in by the subsequent deposits. This vein should be followed down, as it will eventually lead to the bottom of the old valley, and consequently to the bed of the old watercourse or lead.

The country between Cargo and Orange, which forms part of the Canobolas Ranges, consists of siluro-devonian sandstones and shales, diorite and basalt. Probably under the basalt near Orange will be found auriferous gravels. Some fine flagstones are quarried a few miles west of Orange. We next proceeded to Wellington, the road passing over silurian country to Ironbarks, at which town a considerable extent of shallow alluvial ground has been worked, and also several reefs in the vicinity. From Ironbarks to Wellington the formations are principally altered silurian schists, diorite, and marble limestone, while along the Bell and Macquarie Rivers are rich alluvial flats. At Wellington we were joined by Mr. Warden T. A. Browne, P.M. The Wellington Prospecting Association proposed to test certain localities in the Mitchell's Creek District. This gold-field and that of Gulgong and Home Rule, which we next visited, I have already described the geology of in my former reports, wherein I have drawn attention to the formations being of a favourable character for the existence of payable gold deposits. Several of the applications for prospecting in the Gulgong Gold-field were for testing some of the most promising localities, such as the Black Lead, Star Lead, David Buchanan Lead, &c. If the proposed works be carried out, we anticipate that they will open up extensive deep leads.

From Gulgong we proceeded to Rockley and Mitchell's Creek, near Bathurst, and, with Mr. Warden Smith, P.M., considered the claims of the applicants for aid to prospect in these localities.

We next visited the Armidale Districts. Mr. Warden Buchanan, P.M., met us at the Uralla Diggings. Here we find an old tertiary lead resting on hornblendic granite and capped with basalt. In places near the Rocky River, and at Sydney Flat, the basalt and auriferous drifts have been denuded, and the newer deposits derived therefrom have proved very rich. The Bullion Gold-mining Company applied for assistance to prove the lead *in situ* under the basalt. Near Sydney Flat the Long Tunnel Gold-mining Company are putting in a tunnel in the granite at a level that will pass a few feet below the lead. By this means the heavy amount of water in the lead will be readily drained and the wash-dirt easily worked. At the time of our visit this tunnel was already driven 900 feet. When completed there is every prospect of the Company achieving the success which their great enterprise and perseverance deserve. The granite is of a hard nature, contains black mica, hornblende, and much iron pyrites. The gold—usually in the form of fine grains—obtained in this field has evidently been derived from this pyritous hornblendic granite, and therefore the payable portions of the drifts will be confined to the area occupied by this granite. Between Armidale and Uralla there is a considerable extent of tertiary basalt, forming good pasture and agricultural lands. The Moonbi Ranges are granite, which is tin-bearing near Bendemeer. From Tamworth to Warrah the main road passes over varying tracts of devonian sandstones, and shales, granite, greenstone, basalt, and some rocks which are probably of lower carboniferous age. From the latter, Mr. Phillip King, of Goonoo Goonoo, gave me a fine specimen of *lepidodendron*, which is now in the Museum of Mines.

Applications for Government aid to prospect in the Southern Districts of the Colony were next dealt with, and sittings of the Prospecting Board were held at Murrumburrah, Cootamundra, Wagga Wagga, Germanton, Adelong, Gundagai, Bowning, Goulburn, and Bega. The western portion of this country has been previously described by me. For 25 miles south from Goulburn along the road to Braidwood the formations appear to be metamorphic silurian and granite; thence to Braidwood, granite, with occasional belts of diorite; and in the valley of the Shoalhaven the hills on both sides of the river, and at a height of 150 feet above the river bed, are capped with pleistocene tertiary deposits of pebble drift, the surface of which forms flat sandy country for several miles. Where this drift has filled in hollows in the older rocks payable gold deposits may be expected to be found. At Jembaicumbene, 8 miles from Braidwood, have been extensive shallow alluvial diggings amongst hills of granite containing intrusions of diorite. There can be no doubt that the gold, which is mostly in the form of fine grains, though some of it is shotty and filiform, was originally derived both from quartz reefs traversing these rocks and from the rocks themselves, as we also see has been the case at the Major's Creek Diggings, where the granite bed-rock becomes quite porphyritic from the enclosed crystals of hornblende. When a large supply of water can be brought on to this gold-field much of the ground now abandoned could be profitably worked. It is the opinion of Mr. Warden C. De Boos and other residents in this district that water from the Upper Shoalhaven River could be brought by gravitation on to the Major's Creek Gold-field, and thence on to the Araluen Diggings. The same granite formation, though less hornblendic, extends to Araluen, and for 2 miles east of that town. The gold workings of this locality are in an alluvial flat abont 4½ miles long and 1 mile wide, which is walled in by steep granite ranges about 1,000 feet high, forming grandly picturesque scenery. The alluvium, which is mostly sandy loam and gravel, containing layers of vegetable matter and fragments of drift wood, is from 30 to 40 feet deep, and is "stripped" from the top by the sluicing companies working it. One of these parties (Mr. Blachford's) washes about 600 loads in twenty-four hours. The gold is fine and scaly.

From 2 miles east of Araluen, thence along the main road to within 5 miles from Moruya, where there is granite, the country consists of silurian shales and sandstones, more or less metamorphosed and of various colours, from brown to reddish purple. I could not detect any fossils in these rocks, but from their lithological character I believe them to be of lower silurian age. This will be an interesting point to determine, for as yet it is doubtful whether the lower silurian, which is the formation at Baliarat, Sandhurst, and other gold-fields in Victoria, has been observed in New South Wales. The granite continues from Moruya for a distance of 8 miles to the south, and then we have silurian beds for the next 40 miles along the southern road, with one intrusive mass of diorite near Mount Dromedary; thence to Bega (with the exception of a belt of silurian about a mile wide near to and on the south side of the Brogo River) the country is granitic, with patches of diorite in places.

I must, however, mention that at about 9 miles south from Moruya we see basalt resting on tertiary ironstone cement and quartz pebble drift, which drift caps the hills for some distance further south. This deposit appears to be of marine origin; if so, it is the first marine tertiary deposit known on the coast of New South Wales. With the short time at my disposal I was unable to find in it any fossils, but it greatly resembles the marine tertiary along the southern coast of Victoria. At the village of Bodalla occurs a belt of granite about half a mile wide, and extending in a south-easterly direction for nearly 2 miles; it is surrounded by silurian schists containing quartz reefs, and is covered in places by the abovementioned tertiary drift. The soil on these formations is not rich, excepting in the alluvial flats. It supports generally a thick forest containing some useful timber trees, and a more or less dense undergrowth of ferns and brush. But the beautiful fields and meadow lands on the Bodalla Estate, which were brought to their present condition by the late Mr. T. S. Mort, are evidence of the great improvement this land is capable of by judiciously clearing the natural vegetation and cultivating useful grasses.

The granite about 30 miles north from Bega, and near Cobargo, contains large crystals of hornblende, and resembles that of Major's Creek. It is probable therefore that payable gold may be found in this locality, and also in the ranges south-westerly from the Dromedary, where the diorite occurs.

About 7 miles north-east from Bega some auriferous reefs have been opened at the junction of diorite and silurian; coarse alluvial gold has also been found in the neighbouring gullies. This is the locality which the Bega Prospecting Association are prospecting. It certainly deserves the attention of miners. The country around Bega embraces some fine agricultural land; the river flats, though liable to inundation at times, are very fertile, and are chiefly cultivated with corn; on either side for some distance are low granite hills lightly timbered, while beyond rise high broken ranges of granite and slate, covered with dense forests. The physical features of the Bega District are extremely interesting.

In the early part of December I inspected the Barrington Gold-field. My report on this important gold-field is herewith appended (Appendix B).

For about 23 miles from Raymond Terrace along the main Gloucester Road the formation is the carboniferous, consisting chiefly of pebble conglomerates; then for several miles, at intervals, we see porphyry and certain stratified beds as far as Booral. These rocks appear to be of the upper devonian series, and are probably auriferous. From Stroud to Gloucester the beds are chiefly carboniferous and porphyry. At Gloucester, which is on the Australian Agricultural Company's estate, coal is seen cropping out between beds of conglomerate and shales containing impressions of *glossopteris*, *phyllotheca*, &c.

During the latter part of December, according to instructions, I inspected and reported on the coal formations under Bullock Island and certain portions of the Newcastle Harbour. Mr. W. Clarke, Secretary of the Waratah Coal-mining Company, has kindly placed at the disposal of the department fifty-eight diagram sections showing measurements of coal seams and strata in the coal measures of the Newcastle and other coal-fields.

In June, the Legislature having provided for two additional geological surveyors, Mr. E. F. Pittman, L.S., from the Royal School of Mines, and Mr. Lamont H. Greame Young, C.E., F.G.S., Associate, Royal School of Mines, were appointed. Mr. Young, after accompanying myself when inspecting several gold-fields, made an examination of the gold-fields in the counties of Monteagle and Harden. His report and maps are appended (Appendix F), and also his report upon the Bingera Gold-field Reserve, which he inspected for the purpose of indicating what portions might be thrown open for selection. Mr. Young points out that an auriferous deep lead passes down the valley of the Gwydir, near to the township of Bingera. Mr. Young proved himself a very zealous and able officer, and I regret that his acceptance of an appointment elsewhere, more advantageous to himself, should have deprived this department of his valuable services.

Mr. Pittman was sent to make a geological survey of Hill End and Tambaroora. He is still engaged upon this work, and is obtaining much important information regarding the mode of occurrence and position in the silurian strata of the gold-bearing quartz veins. His survey, together with the underground surveys of mines at Hill End recently made by Mr. T. S. Parrott, C.E., L.S., for this department, will afford reliable information, not only regarding the mines upon this important gold-field, but also for guidance in prospecting for other reefs. The reefs hitherto worked are very variable in thickness, extent, and in the yield of gold; as regards the latter for instance, parcels of quartz crushed have yielded up to 2,100 ozs. of gold per ton. Some splendid specimens of gold in quartz from the Star of Peace mine at Hawkins Hill were sent to the Paris Exhibition. They weighed 797·9 ozs., and by the specific gravity test I calculated that they contained 144·9 ozs. of gold. As far as our observations have been made, the auriferous quartz veins appear to be confined to certain beds or strata; and if further examination prove this to be the rule, it will show that future mining operations should be directed only to the reefs traversing those particular sets of strata, and thus prevent the expenditure of capital and labour upon the non-payable portions of the reefs.

During the year a boring has been put down at Newington, by means of the diamond drill, under the direction of Mr. J. Coghlan. After reaching a depth of 1,312 feet the works have been temporarily stopped to make arrangements for continuing the bore with a drill of less diameter.

No coal seam has yet been struck, but as the bore has now reached the coal measures, as indicated by the *glossopteris* obtained, coal may now be met with at any depth, unless the bore should pierce that basaltic formation which comes to the surface on the north side of the Parramatta River. Mr. Coghlan has also commenced a bore near Port Hacking, on the estate of the Hon. Thomas Holt, and preparations are being made for putting down another bore at Moore Park.

It is with deep regret that we have to record the decease, on the 2nd June last, of the Rev. W. B. Clarke, M.A., F.R.S. Mr. Clarke was the greatest authority on Australian geology. His numerous geological writings, including his reports to the Government of New South Wales upon the Northern and Southern Gold-fields of the Colony, are valuable records. But perhaps the most important of them is the fifth edition of his "Remarks on the Sedimentary Formations of New South Wales," the fourth edition of which was contributed to the "Mines and Mineral Statistics of New South Wales," published in 1875, by the Department of Mines.

Mr. Clarke always manifested the greatest interest in the work of the Geological Survey, and most generously gave his valuable advice and assistance. During his researches in Australia, extending over a period of forty years, Mr. Clarke brought together a fine collection of rocks, minerals, and fossils illustrative of the geology of all the Australian Colonies. He also made a map showing the general geological features of the greater portion of New South Wales. In October this collection, the map, and Mr. Clarke's library of scientific works were examined by Mr. Harrie Wood, Under Secretary for Mines, the Rev. Julian E. Tenison-Woods, F.G.S., F.L.S., and myself. This we were deputed to do in order to advise the Government regarding the purchase of them.

I have received from my friend, Mr. Robt. Etheridge, F.G.S., Palæontologist to the Geological Survey of Scotland, a full description with figure of the fossil *unio*, found with the fossil nuts in the pliocene deep leads of the Gulgong Gold-field.

Mr. Etheridge has also added for comparison an exhaustive description of the recent Australian *unionidæ*. I have herewith appended (see Appendix C) this valuable contribution to our recent and fossil conchology, and with it some further descriptive notes (see Appendix D) by Baron Ferd. von Müeller, M.D., C.M.G., F.R.S., &c., Government Botanist of Victoria, on the vegetable fossils, also from the auriferous leads near Gulgong. These are illustrated by two plates of lithograms admirably executed by Mr. A. J. Stopps of the Surveyor General's Department, from very faithful drawings by himself, Mrs. Helena Forde, and Miss Gray.

During the year a valuable work by Mr. Etheridge has been published at the Cambridge University Press, entitled "A Catalogue of Australian Fossils (including Tasmania and the island of Timor), stratigraphically and zoologically arranged." This is a work of vast research, and will prove most useful for reference. The want of such a work has long been felt; it forms indeed a necessary accompaniment to the published literature on Australian geology. In the preface Mr. Ethridge says, "'The Catalogue of Australian Fossils' was commenced in 1868, in conjunction with my friend and former colleague Mr. Norman Taylor, merely with the view of carrying out our duties in connection with the Geological Survey of Victoria, but circumstances over which we had no control rendered the abandonment of the work necessary. It was not again resumed until 1871, then by myself; and through the interest evinced by several scientific friends I have been induced to continue the compilation, during leisure moments, until it has assumed its present proportions.

"The subject of Australian geology and palæontology is even now in its infancy, notwithstanding the rapid strides which have been made within the last few years. It naturally results therefore that although the number of species to be listed may be small when compared with those of other countries, still, often from the absence of definite information, the compilation has been attended with no ordinary difficulty. * * * The present is, so far as I know, the first attempt at a complete list of Australian fossil organic remains; and notwithstanding the daily increasing number of species to be still more largely augmented in the future, I trust that the present effort will be found a tolerably faithful record of Australian palæontology up to the year 1878.

"I have endeavoured to make the catalogue as complete as circumstances will permit, but there are a few papers by colonial authors to which I have not been able to obtain access, and in consequence the data contained in them have been omitted or imperfectly given.

"The object of the 'Catalogue of Australian Fossils' is, first, to give as complete a list as possible of the fossil organic remains of the Australian Continent, arranged in stratigraphical and zoological order; secondly, to indicate all the descriptions, figures, and more important references to each of the species; and thirdly, to point out the principal localities."

On the 5th February Mr. M. Norton brought to this office a fine specimen of pale blue topaz, found at Gundagai. I here place its discovery on record, as it is one of the largest topazes hitherto found in the Colony. It consists of a square prismatic crystal, 3 inches long and 1½ inch thick, and weighs 11 ozs. 5 dwts. troy.

Amongst the donations to the Museum of Mines is a fine collection of fossil leaves from the miocene tertiary beds at Dalton. These were presented by Mr. J. K. Hume, of Yass, who has also sent numerous fossils from the Silurian beds near Yass.

A list of contributors to the Museum is annexed. (Appendix E.)

Mr. Chas. Cullen, Collector to the Geological Survey, has been very successful in obtaining a large suite of fossils from the coal measures of the Northern Coal-fields. With these I hope to be able to furnish small collections to the various institutions which have applied for them, and to exchange for specimens from foreign countries for the Museum of Mines in Sydney.

In October last Mr. A. H. McCulloch, junr., M.P., forwarded to the Museum of Mines some very fine specimens of a fossil fern, found in white shales in the upper beds of the Hawkesbury formation, at Mount Piddington, near Mount Victoria. Two of these specimens I forwarded to Dr. Feistmantel, Palæontologist to the Indian Geological Survey, who has so largely investigated the allied fossil flora of the Indian and Australian carboniferous series. Dr. Feistmantel has determined this fern to be "*Gleichenites odontopteroides* (*Pecopteris odontopteroides* or *Thinnfeldia odontopteroides morr.*), which occurs in the Wianamatta beds, and which is so frequent in the upper beds in Queensland (Ipswich, Tivoli Mines), and also in Tasmania. It would tend to show further that the Wianamatta and Hawkesbury beds are only subdivisions of the same formation."

From the Museum of Mines collections of mineral and geological specimens have been forwarded during the year to the Annual Exhibition of the N. S. W. Agricultural Society, and the Great International Exhibition at Paris.

At the former Exhibition a very large and complete collection illustrated the geological formation and the mineral resources of the Colony, the whole collection numbering some 1,000 specimens.

The collection for the Paris Exhibition included a suite of the representative fossils and rocks from the different formations in the Colony to illustrate its geological characteristics, whilst the mineral specimens were so selected as to show the immense mineral wealth of New South Wales. This collection also comprised about 1,000 specimens.

All specimens were classified and arranged before leaving this department, but, owing to considerable alteration in the original arrangements of space at the Exhibition, some of this work had to be gone over again. This was performed by Professor Liversidge, at Paris, and I have great pleasure in acknowledging the kind and zealous services of that gentleman.

Besides the collection referred to above, this department exhibited large natural-sized sections of the coal measures of New South Wales, which were specially prepared for the purpose, as well as the geological maps published by the department.

It is satisfactory to find that our exhibits attracted great attention from the general public, as well as being a source of great interest to scientific men from all parts of the world, that they were highly spoken of by the Press, and that their merit was suitably acknowledged by the award of a gold medal.

We may therefore reasonably hope that great good will accrue to the Colony both scientifically and commercially from this method of advertising to the world the vast wealth we possess, and which only requires proper development to result in great commercial prosperity.

Baron von Müeller has suggested that we should publish an account of the different varieties of Eucalyptus, in connection with a description of the geological formations which support their growth. Such a work would be very desirable, not only for scientific purposes in showing the range and habitat of the Eucalypti and the conditions of their growth, but for ascertaining what species are adapted to certain soils. These are important subjects to deal with now that our forests are being rapidly reduced and our stock of useful timber trees is becoming exhausted.

In some parts of the Colony, especially those bordering on the coast south of the Shoalhaven, considerable tracts of forest containing valuable timber trees, some of which are worth £2 to £4 each, are being destroyed by selectors ringbarking the trees, so that such work may reckon as "improvements" in fulfilling the conditions of their selections. Seeing that our forests are thus being reduced, not only in the agricultural but also in the mining districts, it will sooner or later become a matter of necessity to replenish our timber reserves by planting certain useful kinds of trees in such localities where the conditions of climate and geological formation are adapted for them. The late Minister for Mines, Mr. W. H. Suttor, M.P, instructed me therefore to carry out, as far as practicable, Baron von Müeller's suggestion. I have accordingly obtained notes and specimens of about twenty varieties of Eucalyptus; but the observations regarding them are not sufficiently complete for issue. Baron von Müeller has offered to furnish gratuitously drawings and descriptions of them for publication by this department. I may add that Mr. Thomas Richards, Government Printer, informs me that the work of illustrating these plants, and also the fossils in the Museum of Mines, can now be effected by means of the photo-mechanical process now being carried out at the Government Printing Office by Mr. H. Ludovico Hart.

C. S. WILKINSON, L. S., F.G.S.,
Geological Surveyor in charge.

APPENDIX. A.

Report on Auriferous and other Specimens from New Guinea.

Geological Survey Branch, Department of Mines,
Sydney, 29 December, 1877.

Sir,

In the late press telegrams from Queensland the announcement is given of the discovery of gold in New Guinea by the Rev. Mr. Lawes and Mr. Goldie's party.

I may inform you that this discovery is in confirmation of what we had anticipated from an examination of the rock specimens already obtained from New Guinea by the Hon. W. Macleay, M.L.C., during his voyage of exploration in the "Chevert," and by Mr. D'Albertis on the Fly River.

Some of the specimens in Mr. Macleay's collection I described in a paper read before the Linnæan Society of New South Wales on the 28th February, 1876; but I purposely refrained from making allusion to the probable occurrence of gold-bearing deposits in New Guinea, lest miners might be induced to rush to that inhospitable country, where at present the lives of Europeans would, from well-known causes, be greatly endangered.

For the same reason I was also silent regarding the geological indications of gold-bearing formations, as shown by the collection of rocks obtained by Mr. D'Albertis on the Fly River. Amongst these specimens were stone tomahawks formed from altered sandstone (probably silurian) and greenstone or diorite, containing in some instances iron pyrites. This greenstone, in association with the silurian and devonian beds, is the main source of the auriferous deposits on some of the principal gold-fields in New South Wales, and it is therefore suggestive of the occurrence of gold in New Guinea. At the same time we have no reason to expect that richer deposits will be found there than are indicated by the auriferous formations in New South Wales, where we have such a vast tract of known gold-bearing country open for profitable mining enterprise. This fact is worth the careful consideration of those intending gold-seekers who may be fascinated by the distant prospect, and to whom the Rev. Mr. Lawes has given such earnest and timely warning against rashly proceeding to Port Moresby, where, the reverend gentleman states, he "is quite sure great misery and loss of life must ensue if there is any influx of Europeans during the wet season."

I have, &c.,
C. S. WILKINSON,
Geological Surveyor in charge.

The Under Secretary for Mines.

Department of Mines, Sydney, 17 January, 1878.

MEMORANDUM: The sample of quartz and auriferous black sand, sent from New Guinea by Mr. Goldie, and submitted for examination by Messrs. Mason Brothers, of Pitt-street, are as follows:—

The black sand consists almost entirely of small crystalline grains of magnetic oxide of iron and specular iron, with a few small pebbles of limonite, brown oxide of iron, and numerous prismatic and octahedral crystals of zircon, the edges of the crystals not being in the least degree waterworn. There were also a few scales of yellow mica and a little quartz sand.

The sample weighed 7¾ ozs., and yielded 5·75 grs. of gold. But this yield affords no certain evidence of the richness of the actual wash-dirt, as we are not furnished with any information as to the number of dishes or quantity of dirt from which Mr. Goldie washed this sample of auriferous sand. The gold was light and scaly, and some of it as fine as dust.

The quartz consisted of broken pieces of very waterworn pebbles or boulders, and showed freely small masses of pale yellow mundic or iron pyrites, but no gold to the naked eye. It, however, yielded on assay at the rate of only 2 dwts. of gold and silver to the ton, the gold being in excess of the silver.

The Under Secretary for Mines.
C. S. WILKINSON, L.S., F.G.S.

List of Geological Specimens collected by the Rev. W. G. Lawes, of the New Guinea Mission.

Specimen	I.	From Kaiputupu—Angular fragment of green silicious rock, probably silurian schist.
"	II.	Do. do. do. do.
"	III & IV.	From Kaiputupu—Quartz from a vein in same green rock.
"	V.	Bed of Kupaloloko—Waterworn fragment of pebble of dark gray quartzite.
"	VI.	Bed of Kupaloloko—Two small angular pieces, similar to II.
"	VII.	Bed of Kupaloloko—Two angular pieces of jasperoid rock, with small veins of chalcedonic quartz.
"	VIII.	Bed of Kupaloloko—Three angular pieces of red jasperoid rock.
"	IX.	Fairfax Harbour—Three angular pieces black oxide of manganese.
"	X.	Fairfax Harbour—Five small waterworn quartz pebbles.
"	XI.	Bed of Kupaloloko—Fragment, 2½ inches long, of a waterworn pebble of indurated schist, probably silurian.
"	XII.	Bed of Kupaloloko—Gseenstone, partly waterworn, containing magnetic iron oxide.
"	XIII.	Bed of Kupaloloko—Waterworn pebbles of green silicious rock, probably altered silurian, similar to Nos. I and II.
"	XIV.	Do. do. do. do.
"	XV.	Bed of Kupaloloko—Angular fragment of greenstone.
"	XVI.	Bed of Kupaloloko—Waterworn pebble of greenstone, with vein of calcite.
"	XVII.	Bed of Kupaloloko—Pebble of altered black slate, containing small crystals of iron pyrites.
"	XVIII.	Taken out of gizzard of a Goura pigeon—Greenstone pebble (¾-inch by ½-inch in size), similar to No. XII.
"	XIX.	Fairfax Harbour—Angular piece of black oxide of manganese.
"	XX.	Fairfax Harbour—Hard, red jasperoid rock, probably altered silurian.
"	XXI.	From Quaibo—Numerous small waterworn pebbles of quartz, sandstone, slate, and red jasperoid rock.
"	XXII.	Bed of Kupaloloko River, near Mt. Vetura—Sample of sand, consisting of about 35 per cent. of black magnetic iron oxide and specular iron, together with quartz, quartzite, trap rock, shale, sandstone, and jasperoid rock. Two assays of this sample gave respectively 3 dwts. 5 grs. and 2 dwts. 19 grs. of gold per ton, averaging 3 dwts. per ton.
"	XXIII.	Bed of Kupaloloko River, near Mt. Mumkaihala—Sample of sand, consisting of altered shale and sandstone, quartz and quartzite, trap, and jasperoid rock, and some black magnetic iron oxide.

Specimen XXIV. **Bed of river between the coast and Mt. Astrolabe, and south of the latter—Sample of sand, consisting of limestone, tufa, quartz, quartzite, trap rock, altered schist, jasperoid rock, and black magnetic iron oxide.**

" XXV. Same locality—Sample of sand, consisting of about 10 per cent. of magnetic iron oxide, besides altered shale and sandstone, trap rock, jasperoid rock, and limonite or brown oxide of iron.

" XXVI. From head of Hood Bay—Sample of sand, containing some recent marine shells, turritella, &c., and consisting chiefly of decomposed trap and nodules of marl, with some small pebbles of slate, quartz, and jasperoid rock, and a few scales of yellow mica.

From these few but interesting specimens obtained by the Rev. Mr. Lawes we get some insight into the geological character of the country lying to the east of Redscar Bay and Port Moresby. The fragments of slate, sandstones, quartz, greenstone, and jasperoid rocks, indistinguishable from specimens of the silurian series from some of the gold-fields of New South Wales, lead us to infer that the lofty Mt. Owen Stanley, Mt. Astrolabe, and intervening ranges are to a great extent, if not wholly, composed of these rocks, and are auriferous. The auriferous character of this part of New Guinea I previously suspected, after examining in 1876 the rock specimens collected by the Hon. William Macleay, M.L.C., from Hall's Sound. But we now have evidence of the actual discovery of gold in these parts by Mr. Lawes, on the Kupaloloko River, and by Mr. Goldie, on the Goldie River. One of the above-mentioned samples, No. 22, of river sand, which contained much black magnetic iron sand, was tested, and the average result of two assays gave at the rate of 3 dwts. of gold per ton. Mr. Lawes informs me that the samples were taken to show the character of the sand in the river beds, and were not reduced by washing. Sample No. 22 was obtained from the Kupaloloko River, a stream parallel with the Goldie River, but further east. Both of these streams run into the Laloke River. Mr. Lawes's discovery is therefore the first evidence we have of the existence of gold on the Kupaloloko.

I have carefully examined all the specimens, and could not detect any other metals of value in them. I may state here again that these rocks only indicate the occurrence of similar formations to those on the gold-fields of New South Wales, and do not warrant the belief that richer deposits exist in New Guinea than will be found in this Colony.

The Under Secretary for Mines.

APPENDIX B.

Report on the Barrington Gold-field.

Sir, Department of Mines, Sydney, 30 December, 1878.

I have the honor to inform you that pursuant to your instructions I have examined the Back Creek or Barrington Gold-field and the adjacent country.

This gold-field is situated about 10 miles west from the town of Gloucester, and is at present defined by a strip of country 3 miles wide extending northwards from the Barrington River to the Bowmans River. Back Creek, where the principal gold-workings occur, takes its rise within this area, amidst steep ranges, which attain an elevation of from 800 to 1,500 feet above the Barrington and Bowman Rivers. These ranges are covered with a thick forest of box, cedar, gum, mahogany, and other timber useful for mining and building purposes, together with a dense undergrowth of scrub, vines, and ferns resembling the luxuriant vegetation of the Illawarra District and of Gipps Land, Victoria, so that the miners have had no slight difficulty to contend with in clearing and forming dray roads from their mines to the crushing-machines and the township. The township is situated near the junction of the two main branches (called the right and left branches) of Back Creek, but it is being rapidly extended up the left branch for a distance of half-a-mile as far as the Rainbow Crushing-machine. There is very little level ground suitable for building upon, owing to the steep declivity of the hills, reaching in places to the bank of the creek. A township has therefore been recently surveyed on more suitable ground, about a mile below the junction of the right and left branches, but the former locality being nearer to the reefs all the houses of business are there at present, and the building allotments command a high price.

On this gold-field twenty distinct lines of gold-bearing reefs have been proved. On nearly all of these the claimholders or leaseholders are either raising stone for crushing or further prospecting the reefs while waiting an opportunity for the crushing of the quartz already raised. In some of the claims other gold-bearing veins have been discovered; for instance, there are three on the Hidden Treasure or Town and Country line, whilst on the Rose and Thistle line, at the head of the right branch, there are five or six sets of veins, from some of which rich specimens have been obtained.

The Mountain Maid Reef, from which 235 tons have been crushed, yielding over 15 ozs. of gold per ton, averages about 14 inches thick, but varies in thickness from 4 inches to 26 inches; it has been opened for about 160 feet along its course, which strikes from E. 15° N. to N.E., underlaying slightly to the S.E. The strata of hard shale and sandstone which it traverses dip S. 20° E. at 25°. The deepest shaft is 100 feet. The reef is accompanied in places by a breccia vein enclosing angular pieces of the bounding walls; it contains much pyrites and a little gold, and appears to have been formed subsequently to the rich vein, for I have seen a specimen showing one vein intersecting the other. The Rainbow Reef is on the same line, further to the N.E. In the prospecting claim, at a depth of 50 feet, the reef occurs in a channel 2 feet wide, within which the reef splits irregularly into several veins separated by partings of black shale, and forms again. Its strike is E. 43° N., slightly underlaying to the S.E., and the strata it traverses dip S. 35° E. at 12°. The Hidden Treasure Reef (Cameron and party's), on the Town and Country line of reef (see Mr. Pittman's map), is being worked by a tunnel. It varies from 6 inches to 6 feet thick, averaging 3 feet, and underlays to the S.W. at an angle of 45°. It traverses indurated shales and sandstones dipping S. 22° W. at 20°. On the hanging-wall in places occurs a casing of unctuous clay, and the face of the quartz in contact with it has a highly polished surface. 100 tons from this reef yielded 3 ozs. per ton. About 150 tons, showing gold freely, now await crushing. The Centennial Reef lies further to the N.W., and also dips to the S.W. It is said to average 2 feet 6 inches thick, varying from 6 inches to 6 feet thick. Two shafts have been sunk on it to depths of 50 and 90 feet. It occurs almost on the summit of the watershed at the head of the left branch, and about 800 feet above the level of the township; 147 tons crushed yielded nearly 2 ozs. per ton, and about 400 tons of similar stone are now ready for crushing. Between this reef and the Hidden Treasure, on the same line, are other claims on smaller gold-bearing veins, of which four have been discovered from 2 to 20 inches thick. One of these, the Town and Country Reef (Harris and party's), was the first reef opened on this gold-field. In another claim on the Centennial Line, the Golden Crown (Lukey, Young, and party's), the reef is from 5 to 20 inches wide, and dips with the strata S. 35° W. at 42°; 48 tons yielded from 2 to 5 ozs. per ton. A shaft has been sunk upon it for 70 feet. The Anderson line of reef strikes almost east and west; it runs in lenticular shoots of quartz from a few inches up to 2 ft. 6 in. thick; 84 tons crushed from one claim on it, the Lady Belmore, yielded from 2 to 4 ozs. per ton. There are other claims at work on this reef. Both of the crushing machines on this creek at the time of my visit were idle, owing to the scarcity of water; this shows the necessity for early provision being made for the conservation of an adequate supply of water for crushing purposes.

Miller's Reef and the Rose and Thistle Reef at the head of the right branch are chiefly in hard metamorphic conglomerate. In Doust's claim, on the latter reef, the quartz averages 8 inches thick, and looks promising; it contains a little galena. In May, Robinson, and Smith's claim the average thickness of the stone is 7 inches, but it is sometimes even a foot thick. From another vein in this claim I was informed that 179 ozs. were dollied or crushed by hand from about 6 cwt. of stone; and in the adjoining claim 75 ozs. were got from one bucketful of stuff. The reefs in the prospectors' claim on the Lady Matilda Line, and Cripps & Co.'s on the Rose and Thistle Line, are in indurated shale; in the former the reef varies from a few inches to 3 feet thick, running in irregular shoots, and dipping generally with the shales from S. at 35° to S. 22° W. at 21° A trial crushing of 1½ ton gave 3 ozs. of gold; about 120 tons of quartz are ready for crushing. A short distance further east is the Royal Bengal Tiger Reef, which strikes in quite a different direction to the last, viz., N. 25° E.; it has been opened to a depth of 40 feet. Other reefs have been found in this locality. The quartz raised from the various reefs at the head of the right branch is awaiting the completion of the battery which Messrs. Williams & Co. are erecting on the creek. The stone which I saw in some of the heaps shows gold freely, and it is expected will give good results.

The Morning Star line of reef is near the Back Creek township. In Fallon's claim, No. 1 west, it dips N. 30° W. at about 43°. Two very ferruginous veins, 2 inches thick each and 3 feet apart, were followed in an easterly direction for a short distance, when they united and became 10 to 15 inches thick; 16 tons from this reef gave 2½ ozs. per ton, and the stone to grass is expected to give a much richer yield. In Baird and Slade's 3-acre lease, No. 1 east, the reef is from 6 to 16 inches thick, striking E. 10° N., with underlay northerly; it has been opened to a depth of 90 feet; 18 tons crushed yielded 2 ozs. per ton. The Melbourne Reef lies to the south of the Rainbow Line; it averages 8 or 9 inches in thickness, and strikes N. 20° E., underlaying easterly. The owners, Messrs. Massey and Reid, showed me some rich specimens from the claim; one small piece weighing about 4 ozs. consisted almost entirely of fibrous filaments and crystals of gold, partly encrusted with oxide of iron, evidently derived from the decomposition of pyrites. About 1⅓ mile south of the township, on the Church and School Lands, is the Mechanics Reef, which crosses the summit of the high range between Back Creek and the Barrington River, at about 1,000 feet above the river. It strikes E. 35° N., underlaying a little to the south-east, and averages 2 feet thick, but varies from 6 inches to 2 feet 6 inches. In the No. 1 claim south the shaft is down 140 feet, which is as yet the deepest shaft on this gold-field. Like the Mountain Maid Reef, this reef is accompanied by a brecciated vein containing angular fragments of sandstone and shale with calcite and much iron pyrites, and also a little gold. The country consists of hard sandstones and shale, dipping E. 4° S. at 31°; 348 tons of quartz from this reef yielded 2 ozs. 13 dwts. per ton. A good road has been formed for the carriage of the quartz from the reef to Messrs. Watt and Driscoll's crushing machine at the Rainbow. There are other reefs being worked which I have not mentioned, but the above will suffice to show the main features of the reefs on this gold-field.

I am indebted to Messrs. Watt and Driscoll for the following particulars of parcels of quartz crushed at their machine at the Rainbow Reef:—

Name of Reef.	Tons crushed.	Yield per ton.
Prospectors' claim, Rainbow Reef	97	1½ oz., about.
No. 1, Rainbow Reef	58	2 ozs.
Prospectors' claim, Lord of the Hills Reef	10	1 oz.
No. 1, Mechanics Reef	135	2 ozs. 15 dwts., about.
Prospectors' claim, Rainbow Reef	21	5 ozs.
Prospectors' claim, Mechanics Reef	9	5 ozs.
No. 1, Lord of the Hills Reef	33	15 dwts., about.
Star of the South Reef	9	1½ oz.
Sawyers' Reef	12	12 dwts.
Mountain Maid Reef	82	15 ozs. 18 dwts.
No. 1, Morning Star	18½	2 ozs.
Prospectors' claim, Morning Star Reef	19½	1½ oz.
No. 1, Morning Star Reef	16	2½ ozs.
Prospectors' claim, Rainbow Reef	56	1 oz.
No. 1, Rainbow Reef	23	1¼ oz., about.
Rosetta Reef	26	18 dwts.
No. 1, Mechanics Reef	129·8 dwts.	3 ozs. 14 dwts.
Prospectors' claim, Rainbow Reef	15	6 ozs.
Prospectors' claim, Mountain Maid Reef	153	15 ozs. 15 dwts.
Prospectors' claim, Mechanics Reef	75	1 oz. 16 dwts.

Higher up the left branch is Messrs. Burley and Thomas's crushing battery, at which I was informed that over 500 tons of quartz had been treated; but I only obtained particulars of 379 tons crushed, which gave an average yield of about 2 ozs. 12¼ dwts. per ton.

From the above interesting particulars it will be seen that 1,244 tons of quartz yielded about 6,153 ozs. of gold, the lowest yield being 12 dwts. per ton from a small parcel of 12 tons of quartz, and the highest nearly 16 ozs. per ton from 235 tons from the Mountain Maid claim. If we disregard the latter as being exceptionally high, the average yield of all the other crushings, viz., 1,009 tons, will be at the rate of 2 ozs. 8 dwts. 9 grs. per ton, which may be taken as about the general average yield of the reefs on this gold-field. I have estimated that there are now upwards of 1,500 tons of quartz raised awaiting crushing.

Alluvial gold was first discovered on Back Creek in May, 1876.

Mr. E. F. Pittman, geological surveyor, in his accurate report on this gold-field, states that the first gold-mining lease (quartz) was pegged out on 25th November, 1876. At the beginning of the present year the population numbered about 250; since then it has increased to about 1,100, of whom about 800 are miners.

The alluvial in the creek beds both of the right and left branches has been worked for gold almost from their sources to their junction with payable but not rich results, though several fine nuggets have been obtained—one of 8 ozs. in weight found on the left branch, near the Rainbow Reef; and several, with one of 35 ozs., in the creek near the reefs at the head of the right branch. About 10 miles west from Back Creek there have been some old alluvial workings on the Burneal Creek, a creek about 3 miles in length, which runs into the Barrington River. Here Messrs. Thomas, Luke, and party discovered a quartz reef near the summit of the range between the Burneal Creek and the Barrington River. The reef traverses brown sandstone, shows gold freely with iron pyrites and galena; it runs from 6 to 12 inches thick, nearly vertical, and strikes E. 40° N.; it is being opened by a drive from its outcrop on the face of the steep range. Several other quartz reefs have been found in the locality, but as yet no gold has been seen in them; some of them will however, I believe, be found auriferous. The formation of the country is similar to that at Back Creek, but apparently in a higher series of strata, in which I found *crinoid stems*, *strophomena*, *spirifer*, *&c.*, and other marine shells. These fossils occur in abundance in the rocks cropping out in the creek near the homestead on the Cobark Station. About 4 miles further to the south a miner named Jackson has opened a reef, which I had not time to visit; it is said to average 15 inches thick, and to contain fine gold. Gold has been found in the alluvial on Mount Moonie, 6 miles north from the Cobark Station, and also in the intervening country, so that there is every probability of auriferous reefs being found throughout this locality and between it and Back Creek, especially in the vicinity of the Two Creeks, near the Barrington, where payable alluvial gold has been got. Several gold-bearing reefs are now being opened near the Bowman River, about 5 miles north-west from Back Creek. There are two parallel reefs within about 200 yards of each other; they strike N. 40° E., underlaying to the S.E.; a third vein, the John Bright, from 6 to 18 inches thick, occurs between them. The formation of the country is hard blue sandstone and shale. There are six claims at work, chiefly on the Golden Spur Reef, which in the prospectors' claim varies from 12 to 20 inches thick, the stone showing coarse gold. The other reef, the Gladstone, was the first discovered, and worked to a depth of 50 feet some time ago by Mr. Selby, who abandoned it, until Messrs. Hughes and Dyson, about three months ago, opened it again. There are now about 50 tons of gold-bearing stone to grass. At present the gold is extracted by "dollying," or crushing by hand with a wooden stamper suspended from the end of a spring-pole. There are good sites for a crushing machine on the Bowman River, within half a mile from the reefs. The gullies on either side of the reefs have been more or less worked for alluvial gold, and as it has been obtained in them for some distance above the line of the reefs already discovered there is no doubt but that other gold-bearing reefs exist in the ranges lying to the south. This country is worthy of being prospected.

I also inspected the two reefs lately discovered about 4 miles west from Dungog, and about 30 miles south from Back Creek. One of these, Gurr and party's, is on the Sugarloaf Range. This reef consists of a network of veins in green chlorite rock, from 12 to 18 inches thick, sometimes making into solid quartz containing iron pyrites. Some specimens, said to have been taken from near the surface, showed gold freely; the reef strikes N. 20° W., and is nearly vertical. About 1 mile further south, on a spur from the main range, occurs another reef, about 1 foot thick in brown sandstone; it has only been opened to a depth of about 4 feet; it was said to contain gold, but I did not see any in the quartz. These reefs are in rock of the same formation as those at Back Creek, and certainly deserve prospecting. Alluvial gold has been found in the country between Dungog and Barrington, and as this tract of country is all more or less of the same geological formation there is every reason to believe that many payable quartz reefs will be discovered in it, and prospecting throughout the district should be encouraged.

As a rule the lines of reefs follow the strike of the strata; but there are one or two exceptions, as in the Morning Star line, where their course is almost in the direction of the dip of the strata; consequently we find reefs running towards various points of the compass.

This may be partly due to the fact that the strata (upper devonian) which these reefs traverse have not been affected by cleavage as have the older silurian formations, which are the principal reef-bearing rocks on some of our gold-fields. The fissures which the quartz has filled opened where the strata offered least resistance to the contracting or other forces causing the fractures; and as these strata of shales, sandstones, and conglomerates vary considerably in composition and hardness and in the direction of their dip, there is little difficulty in accounting for the irregular reefs formed in them. Under these conditions we find, as might be expected, sets of reefs extending perhaps in one general line, but each reef of irregular thickness and length—just as we see in the splitting of a piece of cross-grained timber, which does not split in one straight line, but opens in small cracks along the main line of fracture. These considerations are of importance to the miner, as showing that the thickness of the reefs cannot be relied upon for continuance in either length or depth, and that some reefs may even thin out altogether, but will probably be connected by distinct joints with other similar veins not far off; and thus we may be assured that though the yields from individual mines will fluctuate considerably at times, yet on the whole the quartz-mining industry in this gold-field may be regarded as of a permanent character. Much will depend upon the systematic development of such reefs. Their variable thickness and extent suggest the precaution of providing in many instances a reserve fund for occasional prospecting, and the advantage of the management of the mining operations being under interested and local directors. These and other considerations should not be disregarded, for by mismanagement either of a company's mine or of its funds a good mine may be brought to a standstill, many incautious investors ruined, and the development of the mining industry retarded. Most of the mines are at present held and satisfactorily worked by *bonâ fide* miners, aided sometimes by others who are represented by wages men. In such private companies as these, where the labour and capital employed are mutually interested, the first development of a mine is generally attended by the most satisfactory results. The water supply for Back Creek is very uncertain. In summer the creeks cease running, and the supply has to be drawn from holes in the alluvial, the water from which is brackish and unwholesome. To remedy this deficiency much might be done temporarily by the residents themselves in making dams and tanks, for the construction of which the conformation of the ground is suitable, though the bed-rock is often of a very jointed nature, causing much loss of water by infiltration; but by judicious selection of site for a dam and by puddling the loss might readily be prevented. For the purpose of ascertaining whether a permanent supply could be obtained for this gold-field, I have examined the surrounding country, and find it must be sought for within the watershed of the Barrington River, as the Bowman stream is not sufficient for our purpose.

Two schemes present themselves: These are to obtain the water either by pumping from some point on the Barrington River, or by gravitation from the Arundle River. Either of these schemes might be too costly for adoption until the requirements of the gold-field are more fully developed; but of the two the former would probably be the least expensive, for the Barrington River has such a rapid and large stream that any required water-power might be made available for pumping, so that steam-power might be dispensed with. The nearest point of the Barrington River to the Back Creek township is about 2½ miles distant, in a south-westerly direction, and a high range intervenes, the lowest gap in which, at the head of Black Jack Gully, is about 800 feet (aneroid observation) above the Barrington River, while the confluence of Back Creek and the Barrington River is about 500 feet lower level than the township. So that water would have either to be pumped up the valley of Back Creek to a height of 500 feet, and for a distance of 5 miles, or else for about 1 mile on to a range 900 feet high, whence it might descend by gravitation to the township, a distance of 2 miles, or to any other required part of the diggings. The gravitation scheme to bring water from the Arundle River and its branch, the Delgree Delgree Creek, above Cobark Station, would necessitate the cutting a race between 30 and 40 miles in length through very rocky country; and as payable reefs are likely to be found in any part of this country future discovery may render the construction of this water-race advantageous to the district. I was informed that the Back Creek Progress Committee had applied for a small water reserve to be made on Duffer Gully. I examined this gully, which is conveniently situated for the purpose. This reserve should, I think, be made to include the ground for a width of 5 chains on both sides of the bed of the gully, and for a distance of half-a-mile along it from its junction with the right branch. In this area a reservoir might be made at an elevation of 100 feet above the town, to which the water might bo conducted by a line of pipe about half-a-mile in length.

In conjunction with Mr. Warden Rowling, P.M., I have elsewhere defined the boundaries for the extension of the gold-field.

In conclusion, I may mention that specimens of auriferous quartz have been presented to the Museum of Mines by Messrs. Cameron and party, Messrs. May, Robinson, and Smith, Mr. Denecker, Messrs. Thomas, Luke, and party, and Mr. A. C. Thompson, while others have kindly promised to send specimens from their reefs.

I have, &c.,
C. S. WILKINSON,
Geological Surveyor in charge.

The Under Secretary for Mines, Sydney.

APPENDIX C.

ON a Species of Unio, discovered in the Home Rule Lead, Gulgong, New South Wales, by C. S. WILKINSON, F.G.S., Geological Surveyor in charge, New South Wales. By R. ETHERIDGE, Junr., F.G.S. (Corr. Member R. Socs., Victoria and Tasmania).

1.—INTRODUCTION.

IN a report to the Mining Department of New South Wales "On Payable Gold in our Coal Measures," published in the *Sydney Morning Herald*, Decr., 2nd, 1876, and several other newspapers,[1] my friend and former colleague, Mr. C. S. Wilkinson, F.G.S., announced the discovery by himself of a *Unio* in one of the "deep leads" of the Gulgong Gold-field. With his usual kindness, to which I have been beholden on more than one occasion, and with an utter disregard for the vicissitudes of the "post," my friend was kind enough to forward this unique specimen to me for description, and it now affords me much pleasure to be able to forward a few notes on it.

Before describing the specimen in detail I purpose giving a brief sketch of previous discoveries of fossils in beds intimately associated with Australian "deep leads" or other kinds of tertiary auriferous deposits. Succeeding this will be found a detailed list of the recent species of the genus *Unio*, found in Australian waters, for comparison with the fossil, with a few remarks upon them. The affinities of Mr. Wilkinson's *Unio* will then be entered into, and in conclusion it will be described.

2.—FOSSILS HITHERTO NOTICED IN CONNECTION WITH AUSTRALIAN GOLD DRIFTS.

IN his memoir "On the Recent and Ancient Natural History of Victoria"[2] Professor M'Coy, F.G.S., recorded the discovery of the bones of a wombat (*Phascolomys*) "in the solid hard stony ferruginous auriferous drift, called 'cement' by the diggers, at a great depth in the sinkings at Dunolly, the material being so hard that the jaws could only be cleared by a stonemason's chisel." The occurrence of the remains of this wombat is again referred to in a further edition of the same memoir, under the title, "On the Recent Zoology and Palæontology of Victoria,"[3] where the name of *Phascolomys Pliocenus* M'Coy is proposed for them. Although again mentioned in a list of Victorian fossils prepared by Professor M'Coy for Mr. R. B. Smyth's first "*Progress Report*,"[4] the name, so far as I am aware, remained a manuscript one till the appearance of the first decade of the *Prodromus of the Palæontology of Victoria*, wherein *O. Pliocenus* is fully described and figured. Although "fossil bones of marsupials have been found in very recent accumulations covering wash-dirt,"[5] yet the occurrence of these or other fossils in connection with the older tertiary auriferous deposits appears to be by no means common. The next most important discovery of this kind was that by

---

[1] "*Sydney Evening News.*" Nov. 30th, 1876. "*Queenslander,*" Dec. 16th, 1876.

[2] Victorian Intercolonial Exhib. Essays, 1868, p. 168—Annals Nat. Hist. 1862, i-ix, p. 137.

[3] " " " " 1866. " " " 1867, xx. p. 175.

[4] Geol. Survey Victoria—Report of Progress, 1874, p. 36.

[5] Mining and Min. Statistics, Victorian Intercolonial Exhib. Essays, 1872, p. 18.

Mr. Bernard Smith, in 1872, of shells in a ferruginous stratum with brown iron ore, 38 feet above the "wash-dirt," at the Welcome Rush, near Glenorchy, by Stawell, Victoria, and 78 feet from the surface. The fossils in question were stated by Professor M'Coy to be species of *Turritella*, *Terebra*, *Arca*, *Mactra*, and perhaps *Turbo*.[1] On the east side of the Glenorchy Road, 5 miles north-west of Stawell, this same deposit was again explored some years later by my friend Mr. Norman Taylor, who obtained a much more satisfactory collection of fossils. These have been examined by Professor M'Coy, and figured in Mr. Smith's second "*Progress Report*."[2] The more important species are

Ditrapa Warmbetiensis *M'Coy*.
Lepralia Stawellensis „
Tellina Krausei „
Nucula Marthæ „

A more detailed account of the occurrence of these fossils will be found in Mr. Taylor's "Final Report on the Geology of Stawell."[3] Mr. R. B. Smyth appears to consider the bed yielding these remains to be of the epoch of the "oldest drifts" (? Lower Pliocene),[4] and perhaps of the same age as the Flemington tertiary beds, near Melbourne.[5] The marine nature of the fossils is evident, and it is interesting to find from Professor M'Coy's report that *Tellina Krausei* and *Nuculi Marthæ* range as low as the Schnapper Point oligocene series of Hobson's Bay.

The *Unio* found by Mr. Wilkinson, and mentioned in the opening sentence of this paper, comes next in order. The information contained in the newspaper account is much augmented in Mr. Wilkinson's "Progress Report of the New South Wales Geological Survey during the year 1876,"[6] wherein he states that the discovery of this shell at a depth of 126 feet from the surface in the Home Rule Lead associated with fossil fruits, "is interesting, inasmuch as this is the first fossil shell of the kind yet found in pliocene tertiary gold drifts."[7] According to Mr. Wilkinson, another of the Gulgong Leads, the "Magpie," has yielded, at a depth of 40 feet, a portion of a tooth of *Diprotodon*, bones of *Halmaturus*, and an incisor and foot-bone of *Macropus*, a discovery of very considerable importance in the time-history of these marsupials.

Lastly, I must not omit to mention that Mr. R. M. Johnston, of Launceston, Tasmania, has discovered several specimens of a *Unio* in tertiary deposits around Launceston,[8] which he considers to be of lacustrine origin, associated with leaves and other remains of plants. I am not aware that the beds in question are auriferous.

Although not at present occupied with fossil plants, I cannot omit to mention the admirable work which has been done by my friend Baron von Müeller, M.D., F.R.S., in his researches amongst the fossil fruits from the "deep lead," of Haddon, Nitningbool, and other places in Victoria, and Orange and Gulgong in New South Wales.[9] I trust that we have only seen the commencement of his labours in this direction.

8.—THE RECENT AUSTRALIAN SPECIES OF THE GENUS UNIO.

One of the branches of Australian zoology which has been least systematically worked at is that of the *Unionidæ*. Many so-called species have been described at various times, but so far as I can see, and I have investigated the subject to some extent, authors appear to have described forms with too little attention to their predecessors' work. The following list comprises all the species described from Australian waters, so far as I have been able to ascertain, and even one or two of these are perhaps doubtfully Australian. I have attempted no synonomy, such would be impossible without both the types and a large series of authenticated specimens before one; but I have simply given the views of one or two well-known writers on the subject, under each species, and I must leave those possessing good collections to work out the synonomy for themselves.

---

[1] Mining and Min. Statistics, Victorian Intercolonial Exhib. Essays, 1872, pp. 18 and 19—Geol. Mag. 1872, ix. p. 335—Smyth's Report of Progress, 1874, p. 36; *id*. 1875, p. 21.

[2] Geol. Survey of Victoria, 1875, pp. 21 and 22, f. 1-4; also P. Report, iii. 1876, p. 49.

[3] Progress Report, iii. 1876, p. 264.

[4] *Ibid*, p. 48.

[5] Progress Report, ii. 1875, p. 22.

[6] Annual Report, Department of Mines, New South Wales, for the year 1876. Sydney, 1877, pp. 147-177.

[7] *Ibid*, p. 172.

[8] "Regarding the composition and extent of certain Tertiary Beds in and around Launceston" (*Monthly Notices, R. Soc. Tas.*, June-August, 1878, pp. 39-47, 3 plates).

[9] "Succinct observations on a new genus of Fossil Coniferæ—Spondylostrobus."—(*Reports, Mining Surveyors and Registrars, Vict., March 31st, 1871.*) "New Vegetable Fossils of Victoria."—(*Ibid. June, 1871, to September, 1876.*) "Observations on New Vegetable Fossils," 8vo., Melbourne, 1874. "Descriptive Notes on the Tertiary Flora of New South Wales."—*Annual Report, Dept, of Mines, N.S. Wales*, for year 1876, Sydney, pp. 178-180,

1. UNIO DEPRESSUS.—*Lamarck.*
Hist. Nat. Anim. sans Vertèbres, 1819, vi. pt. 1., p. 79.
Philippi, Conchylian iii., heft., 3 Nov., 1848, p. 81, t. 5, f. 5.
Reeve, Conch. Iconica. xvi., Mon. Genus Unio, 1868, t. 18, f. 81.

See remarks under *U. Australis*, Lamarck; *U. Profugus*, Gould; *U. Balonensis*, Conrad; and *U. Angasi*, Reeve.

2. UNIO AUSTRALIS.—*Lamarck.*
Hist. Nat. Anim. sans Vertèbres, 1818, vi. pt. 1., p. 80.

Dr. Isaac Lea, the eminent writer on the genus *Unio*, says, in the third edition of his "Synopsis of the Family Unionidæ,"[1] when speaking of this species, "I very much suspect that *Australis* and *Depressus* (Lamk.) are the same," an opinion which I think will in all probability prove to be correct, judging from specimens in my possession.

3. UNIO NOVÆ HOLLANDIÆ.—*Gray.*
Proc. Zool. Soc., 1834, p. 57. River Macquarie, N.S.W.

Very little appears to be known about this species. It is a wide nodulose shell.

4. UNIO MULTIDENTATUS (*Parreyss m.s.*)—*Philippi.*
Conchylien iii., heft. 2 Nov. 1847, p. 46., t. 3, f. 4.

A smooth oval shell. Lea cites it as Australian,[2] but gives no locality; Philippi merely says, "Nova Hollandia."

5. UNIO PROFUGUS.—*Gould.*
Proc. Nat. Hist. Soc., Boston, 1850, iii., p. 295.
Wilkes, U.S. Exploring Expedition, Moll. and Shells, 1852, p. 428, atlas, t. 37, f. 542, a. and b., Hunter R., N.S.W.

In the first part of the fourth edition of his "Synopsis,"[3] Lea places this form as a synonym of *U. Depressus* (Lamk.), although in that portion of the work devoted to the "Geographical Distribution" it is retained as a separate species.[4] This may be so, although, judging merely from Gould's figure, I think it is an open question.

6. UNIO AMBIGUUS (*Parreys's m.s.*)—*Philippi.*
Conchylien iii., heft. 2 Nov., 1847, p. 47, t. 3, f. 2.
Reeve, Conch. Iconica. xvi., Mon Genus Unio, 1868, t. 69, f. 355.

In the third edition of the "Synopsis,"[5] Lea places this as a synonym of *U. Australis* (Lamk.) Dr. Philippi considered *U. Ambiguus* (Parreyss) to be the young of *U. Australis* (Lamarck)[6]; "Nova Hollandia" (*Philippi*).

7. UNIO AUCKLANDICUS.—*Gray.*
Diffenbach's Travels in N. Zealand, 1843, ii p. 257.
Reeve Conch. Iconica xvi, Mon. Genus Unio, 1868, t. 30, f. 156.
Hochstetter, New Zealand, &c., 1867, p. 269.

Lea gives this as an Australian species (vide Woodward), but cites no definite locality.[7] It is a smooth, oval, and elegant shell.

8. UNIO CUCUMOIDES.—*Lea.*
Observations on the Genus Unio iii, p. 30, t. 7, f. 2.
Reeve, Conch. Iconica xvi, Mon. Genus Unio, 1868, t. 20, f. 89.

A good and characteristically marked species—one of the best so amongst the Australian forms. It is a wide and very plicate shell. Hunter and Richmond Rivers, N.S.W.

9. UNIO SUPERBUS.—*Lea.*
Observations on the Genus Unio iv, p. 39, t. 42, f. 11.
Reeve, Conch. Iconica xvi, Mon. Genus Unio, 1868, t. 59, f. 295.

This shell is stated by Lea to be from New Holland,[8] although, in the fourth edition of the "Synopsis," it is not specially noticed as being an Australian form. The statement requires confirmation.

10. UNIO CULTELLIFORMIS.—*Conrad.*
Proc. Acad. Nat. Sciences, Philadelphia, v, p. 10.
Jour. Acad. Nat. Sciences, Philadelphia, 2nd ser. ii, p. 295, t. 26, f. 2.

Originally described by Conrad as a distinct species—*U. cultelliformis.* Was subsequently placed as a synonym of *Unio depressus*—Lamarck—as it "appears to be an adult, or a large variety of Lamarck's species." In the third edition of the "Synopsis,"[9] Lea doubted the authenticity of this shell as an Australian species at all, but thought it might be a form of the American *Unio complanatus.* In the fourth edition of the "Synopsis," however, Lea both repeats his view,[10] and at the same time places *U. cultelliformis* as a distinct species in that portion of the work devoted to the "Geographical Distribution."[11] He does not agree with Conrad in referring it to Lamarck's species. Bogan R.

---

[1] 1852, p. 28, note 5. [2] Synopsis Farr. Unionidæ, 4th ed., 1870, p. 103. [3] 1870, p. 54. [4] p. 103. [5] 1852, p. 28. [6] Conchylien iii, Left. 3 Nov., 1848, p. 81. [7] Synopsis, 4th ed., 1870, p. 103. [8] Observations iv. p. 39. [9] 1852, p. 32, note., [10] 1870, p. 52. [11] p. 102.

11. Unio Balounensis.—*Conrad.*
Jour. Acad. Nat. Sciences, Philadelphia, 2nd ser. ii, p. 295, t. 26, f. 3.

Lea[1] places this species as a synonym of *U. depressus* (Lamk.), in which he is followed by Reeve[2]; but again, in the "Geographical Distribution" of the fourth edition of the "Synopsis,"[3] he retains it as a distinct species. Conrad does not admit Lea's view of the matter, but considers his *U. Balounensis* and Lamarck's *U. depressus* as distinct. Baloune R.

12. Unio Nepeanensis.—*Conrad.*
Jour. Acad. Nat. Sciences, Philadelphia, 2nd ser. ii, p. 296, t. 26, f. 4.
Reeve, Conch. Iconica xvi, Mon. Genus Unio, 1868, t. 23, f. 110.

An oblong-oval shell, rather inclined towards a square form, having on the umbones irregular angulated wrinkled plicæ, concentrically arranged. Lea considers this identical with *U. dorsuosus* (Gould)[4]. Nepean R.

13. Unio Shuttleworthis.—*Lea.*
Observations on the Genus Unio vi, pt. 1, p. 24, t. 28, f. 19.
Reeve, Conch. Iconica xvi, Mon. Genus Unio, 1868, t. 32, f. 167.

A fine large shell, which Dr. Lea gives as from "Australia." It has a purple and iridescent nacre. Through the kindness of the Rev. J. E. Tenison-Woods I am in possession of a specimen from the Bogan River, near its junction with the Burdekin River, N.Q.

14. Unio mutabilis—*Lea.*
Observations on the Genus Unio vii, pt. 2, p. 66, t. 38, f. 167.
Reeve, Conch. Iconica xvi., Mon. Genus Unio, 1868, t. 24, f. 112.

A widely-elliptical, smooth, compressed, and very inequilateral shell. Murray R., S.A.; Brisbane Water; New Zealand.

15. Unio vittatus.—*Lea.*
Observations on the Genus Unio vii, pt. 2, p. 67, t. 38, f. 128.
Reeve, Conch. Iconica, xvi, Mon. Genus Unio, 1868, t. 18, f. 83.

An elliptical, inflated, and inequilateral shell—cardinal teeth, double in the right valve, and single in the left valve. Australia (*Lea.*)

16. Unio Wilsoni.—*Lea.*
Observations on the Genus Unio vii, pt. 2, p. 74, t. 40, f. 137.
Reeve, Conch. Iconica, xvi Mon. Genus Unio, 1868, t. 88, f. 472.

Dr. Lea remarks that this is a very simple species, with no marked character beyond the double cardinal tooth in the right valve. Eastern branch of Isaac's Plain, N.S. Wales.

17. U. (Alasmodon) Stuarti.—*Adams and Angas.*
Proc. Zool. Soc., 1863, p. 417.
App. to Stuart's Explorations in Australia, 1864, p. 491.
Reeve, Conch. Iconica xvi, Mon. Genus Unio, 1868, t. 54, f. 279.

A smooth, oblong shell. Mt. Margaret Lagoon, Central Australia (*Adams and Angas*); Port Jackson, N.S.W. (*Lea*). I have a young form of this shell, thanks to the Rev. J. E. T.-Woods, from Abbott Bay, Cape Upstart, N.Q.

18. U. (Alasmodon) Evansi.—*Adams and Angas.*
Proc. Zool. Soc., 1864, p. 39.
Reeve, Conch. Iconica xvi, Mon. Genus Unio, 1868, t. 56, f. 285.

A smooth, subrotund shell. Lagoons of Murray R., S.A.

19. Unio Parramathensis.—*Lea.*
Observations on the Genus Unio xi, p. 64, t. 20, f. 59.

An oval, sulcate form, which (Dr. Lea remarks) is in outline very close to *U. Wilsoni* (Lea), but the two species differ much in colour of epidermis and in the beaks. Parramatta River, N.S.W.

20. U. Moretonicus.—*Reeve.*
Conch. Iconica xvi, Mon. Genus Unio, 1868, t. 24, f. 118.

After describing this species, Mr. Lovell Reeve, in another portion of his "Monograph,"[5] appears to consider it as only a synonym of *U. Australis* (Lamarck). Lea has entered it in the fourth edition of his "Synopsis" as a distinct species.[6] Moreton Bay (*Reeve*); Tasmania (*Reeve and Ten.-Woods*).

21. U. Angasi.—*Reeve.*
Conch. Iconica xvi, Mon. Genus Unio, 1868, t. 55, f. 282.

Reeve assigned this species to Lea, but the latter repudiates the authorship.[7] He considers it as a synonym of *M. depressus* (Lamarck). Strangeways River, N. Australia (*Reeve*). I am indebted to Mr. W. T. Bednall, of Adelaide, for specimens of this species from near Port Darwin, N.A.

22. U. Jeffreysianus.—*Lea.*
Observations on the Genus Unio xiii, p. 27, t. 7, f. 20.

Dr. Lea states that amongst other shells this resembles the Australian species *U. vittatus* (Lea). Australia (*Lea*).

---

[1] Synopsis, 3rd ed., 1852, p. 33. [2] Conch. Iconica xvi, Explanation of table 18. [3] 1870, p. 103. [4] Synopsis, 4th ed., 1870, p. 30. [5] Explanation of table 69. [6] 1870, p. 43. [7] Synopsis, 4th Ed., 1870, p. 54, note 5.

23. UNIO FULMINEUS (*Parreyss, m.s.*)—*Philippi.*

Conchylien iii, heft. 2 Nov. 1847, p. 46, t. 3, f. 5 and 6.

Stated by Philippi to be from "Nova Hollandia," on the faith of Parreyss, but Dr. Isaac Lea, in the 4th Ed. of the "Synopsis" places it as a synonym of *Unio corrugatus* (Retz), and does not record it at all as an Australian, but as an Asiatic species. It is evidently a well-marked form, and could be easily distinguished by the radiately-angular ornamentation. Its reference as an Australian shell requires confirmation.

24. UNIO CUMINGII.—*Dunker.*

Lea, Synopsis of the Unionidæ, 4th Ed., 1870, p. 31.

This is placed by Lea as a synonym of *Unio cucumoides* (Lea). I am not acquainted with Dunker's original description, but doubtless Dr. Lea is correct. The locality given is Richmond River, Australia.

25. UNIO SP. IND.

Conrad, Jour. Acad. Nat. Sciences, Philadelphia, 2nd ser., ii, p. 296, t. 26, f. 6; Bogan River.

Mr. Conrad remarks that this cannot be distinguished from a common variety of *Unio complanatus*, an American shell.

As before stated, the title of the foregoing names to rank as representing good and well defined species can be ascertained only by the examination and comparison of a large number of specimens, and an inspection of as many of the types as are in existence; the notes attached to each will at once show how great a difference of opinion exists between authorities as to their value. The list of recent species was merely introduced here as introductory to a comparison with the Gulgong fossil, which will next engage our attention.

4.—ON THE AFFINITIES OF THE GULGONG FOSSIL UNIO.

In comparing Mr. Wilkinson's specimen with the known recent Australian forms, three species may be at once eliminated from consideration, as their form and general appearance are sufficient evidence for their discrimination, viz., *Unio superbus*, Lea; *U. fulmineus*, Philippi,[1] and *U. cucumoides*, Lea. With two others I am not sufficiently acquainted to institute a comparison, *Unio Cumingii*, Dunker, and *U. Novæ Hollandiæ*, Gray. The Gulgong specimen is one of those forms inclined towards the widely elliptical Uniones, so that we may still further dismiss from consideration those not possessing this outline, but on the contrary, distinguished in some degree or other by more of the simply oblong, sub-oval, transversely-elliptical, or trapezoidal form; such are *Unio depressus*, Lamk.; *U. Australis*, Lamk.; *U. vittatus*, Lea; *U. Balouensis*, Conrad; *U. Nepeanensis*, Conrad; *U. Ambiguus*, Parreyss; *U. Moretonicus*, Reeve; *U. Evansii*, Adams and Angas (as figured by Reeve); *U. Wilsoni*, Lea; *U. profugus*, Gould; *U. multidentatus*, Philippi; and *U. Jeffreysianus*, Lea.

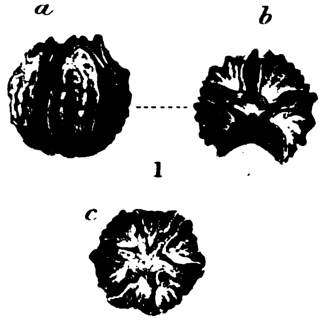
With the remaining forms a more detailed comparison is necessary. *Unio mutabilis*, Lea, is too widely elliptical, or too lithodomoid for the Gulgong fossil, too accuminate anteriorly, and the distant growth markings are wanting. *U. Paramattensis*, Lea, appears to be somewhat nearer our shell, but the umbones are rather too posterior in position, there is too largely a developed umbonal slope, and in our fossil there is no trace of a carinato posterior slope as in Lea's species. *U. Shuttleworthii*, Lea, is too strong a form in every way, the posterior triangulation affording a good point of separation, whilst the smooth even surface of the fossil does not at all correspond with the coarse furrowed condition of that species. The same points may be taken as distinguishing *Unio Angasi*, Reeve, especially as Mr. Edgar Smith, of the British Museum, suggests to me that *U. Shuttleworthii* is only an old form of this. The fossil form appears to lack the long straight hinge line, well-defined anterior end, and long obliquely truncated posterior end of *U. Stuarti*, Adams and Angas. After a careful consideration of all the facts, it appears to me that *U. mutabilis*, Lea, *U. Aucklandicus*, Grey, and another form, *U. lutulentus*, Gould,[2] all put in a claim for relation with our fossil, but of these *U. Aucklandicus* has the strongest claim. I am glad to say that in this opinion I am supported by Mr. Edgar Smith (Zool. Dept., Brit. Museum) and Mr. G. Sharman (Mus. Pract. Geology), who were both kind enough to compare the specimen with type forms of *U. Aucklandicus* in the conchological collection of the British Museum, irrespective of my own investigations. This view is borne out by the fact that *U. Aucklandicus* is stated by Lea[3] to be an Australian shell as well as a New Zealand form, and its occurrence in the fossil state is at the same time not unrecorded, for Capt. F. W. Hutton, F.G.S., &c., has

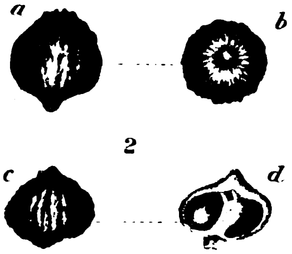
---

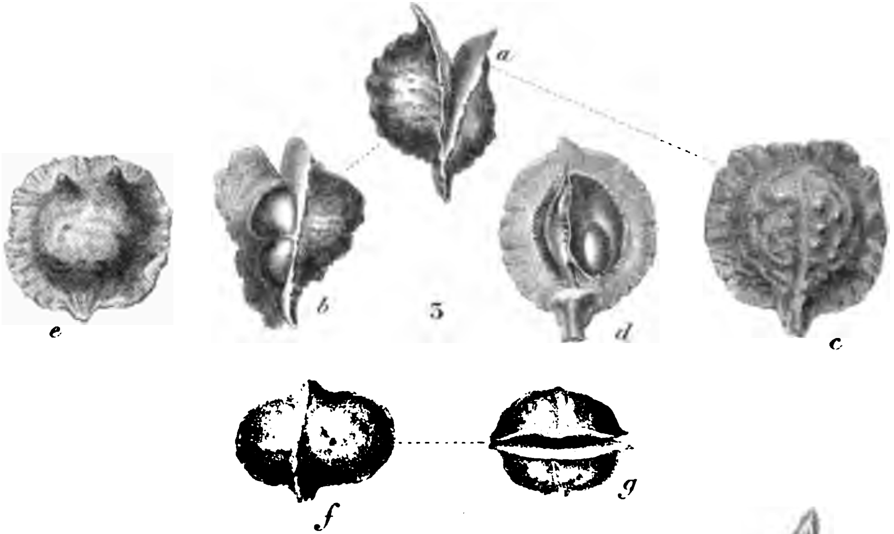
[1] If it is an Australian species.

[2] Wilkes, U.S. Exploring Exped., Mollusca and Shells, by Gould, 1852, p. 428. Atlas, t. 37, f. 542, a and b.

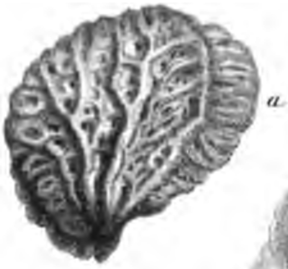
[3] Synopsis of the Unionadae. 4th ed., 1870, p. 103.

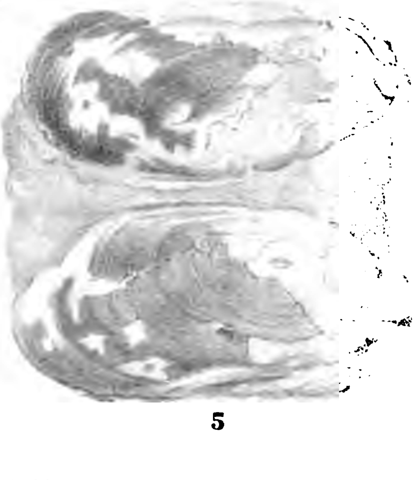






4





5

Helena Forde del. Nos 1 to 4. A. Gray del. No 5. Arthur J. Stopps lith.
Printed at the Surveyor General's Office, Sydney.

provisionally described the shell from the coal formation of Dunstan, Otago[1]; he says, "as the teeth cannot be seen, the identification of this species is doubtful." I may add that the same remark applies in the present instance, for the external portions of the shell only are visible. As a means of rendering a distinction between the typical form of the species and the fossil, I have much pleasure in proposing for the latter the varietal name of *Unio Aucklandicus*, Gray, var. *Wilkinsoni*, mihi.

5.—Description of the Specimen

Unio Aucklandicus, *var.*, *Wilkinsoni*, *var. nov.*

Chars.—Shell oblongorate, very inequilateral, expanding a little posteriorly; anterior side very short and rounded; posterior side obliquely truncated and obscurely bi-angled; umbones quite anterior, decorticated and depressed; epidermis yellowish-olive, delicately thread-striated on the posterior side, but almost quite smooth and shining on the anterior side and body of the shell; anterior muscular sears deep and well defined; pallial line well marked in the anterior region.

Obs.—The state of preservation of the specimen does not permit of a more detailed description than the above, and as we have merely the exterior exhibited to us, the dental formula cannot be given. The characters of the anterior muscular impression and the pallial line are revealed by the accidental removal of the shelly matter, more especially in the left valve. During fossilization a slight amount of crushing has taken place, otherwise the original form of the shell is perfectly well preserved.

Locality and Horizon.—In buff-coloured pipeclay(?), Home Rule Lead, Gulgong Gold-field, New South Wales, at a depth of 126 feet from the surface, associated with the following fossil fruits:—Octhodocaryon Wilkinsonii, *F. v. M.*; Eisothecaryon semiseptatum, *F. v. M.*; Illicites astrocarpa, *F. v. M.*; Pentacoila Gulgongensis, *F. v. M.*; Pleiacron elachocarpum, *F. v. M.*; Acrocoila anodonta, *F. v. M.*; Phymatocaryon bivalve, *F. v. M.*, Plesiocapparis leptocelyphis, *F. v. M.*; Spondylostrobus Smythii, *F. v. M.*; Var. cryptaxis, *F. v. M.*

Collector.—C. S. Wilkinson, Esq., F.G.S., Government Geologist of New South Wales.

N.B.—I am greatly indebted to Miss Alice Gray, Edinburgh, for the accompanying accurate drawing.

Appendix D.

Descriptive Notes on the Tertiary Flora of New South Wales, by Baron Ferd. von Müeller, C.M.G., M. & Ph. D., F.R.S. (Vegetable Fossils of the Upper Pliocene age, discovered at Gulgong, by C. S. Wilkinson, L.S., F.G.S., Government Geologist; and described by Baron Ferd. von Müeller, C.M.G., M.D., F.R.S.)

Plate III, Fig. 1.

Spondylostrobus Smythii—*Var Cryptaxis.*

Valves longer than the auxiliary body, or nearly as long, the latter concealed by them; narrow interstices only, or none, between the valves.

Eisothecaryon—*F. von Müeller.*

Fruit rather small, bony, globular, slightly depressed or compressed, faintly wrinkled outside, indehiscent, or towards the summit bivalvular, septum intruding longitudinally, and from one side only into the cavity, reaching the middle of the fruit, flat towards the wall, but turgid towards the centre of the cavity; seed unknown.

I have preferred placing into a new genus to regarding it merely as a species of the genus Villaresia of the living creation, although the existence of two Villaresia in Eastern Australia at the present day strengthens much the assumption of its being represented there also at the pliocene period. If, however, the view held by many should be adopted also in this instance, that the congruency of merely one organ of a fossil plant with that of a living one ought to suffice for establishing generic identity, then this new fossil would find its systematic location in Villaresia.

---

[1] Cat. Tertiary Moll. and Echinodermata of N. Zealand, &c., 1873, p. 25.

Plate III, Fig. 2.

EISOTHECARYON SEMISEPTATUM.

Fruit measuring from nearly ½ inch to ¾ inch, possibly soft in a fresh state, oftener blunt than pointed at the apex, the tinged portion of the septum somewhat hollow along its centre; seed unknown, but in all probability curved around the dissepiment.

Plate III, Fig. 3.

PHYMATOCARYON BIVALVE.

Fruit roundish, much compressed, bivalved, two-celled, blunt or slightly protracted at the apex, almost smooth or but slightly tubercular outside, the valves diverging from near the base, one of the cells only seed-bearing, seed more than half as long as the valves.

Closely allied to P. Angulare, though probably not a mere variety; the valves not three in number, and more acute at the edge.

As long as we remain unacquainted with the foliage and flowers of the plants which yielded these fruits, it will be most convenient to treat them as if they belonged to one genus. In this we are all the more justified, because in the living vegetation a similar variability of the number of fruit valves is demonstrated by very many genera; a familiar instance being that of Pittosporum, the valves of which in different species vary from two to five. Evidently no sarcocarp existed in P. Angulare and bivalve, nor has such been seen in any of the numerous specimens of P. Mackayi, which more latterly came under review. Of a valvular putamen, however, within a sarcocarp, the genus Inglaus furnishes a well-known example.

WILKINSONIA—*F. von Müeller.*

Fruit completely bivalved, one-celled, almost orbicular, more or less truncate, strongly compressed, nearly flat, irregularly traversed by several longitudinal prominent and somewhat anastomosing ridges; seed, seemingly only one, flat, roundish, occupying fully half the space of the valves; its embryonic structure not yet ascertained.

Plate III, Fig. 4.

WILKINSONIA BILAMINATA.

In the Black Lead of Gulgong, 140–175 feet deep beneath a layer (15 feet thick) of basalt—C. S. Wilkinson, and C. E. Barnard, M.D.

The first specimens of this remarkable fossil were obtained through the circumspect exertions of the Government Geologist of New South Wales, C. S. Wilkinson, Esq., F.G.S., through whose departmental action also many other palæontologic relics of the sister colony became known. Some of the first discovered specimens of this apparently rare fossil were hardly half the size of those kindly transmitted by Dr. Barnard, the dimensions of which may be estimated from Major Shepherd's excellent lithograms. The form verges rarely into oval; one of the valves is occasionally more convex than the other. The ramified main ridges number usually six, they are sometimes slightly flexuous; the interstices formed by the reticulations constitute often deep depressions; the edge of the valves acutely attenuated; the laminæ closely appressed to each other, the exterior ridges nearer to the next than to the margin, and from these lesser elevations radiating. Seed closely filling the shallow cavity in large specimens measuring rather above one inch in length and breadth; its substance too much decayed in the samples hitherto examined to ascertain the mode of attachment. The peduncular or pedicellar cicatrix also not yet observed to arrive at a knowledge of the relative position of the seed.

The plant producing this remarkable fruit may perhaps have belonged to the order of sapindaceæ; but with the material at present available it is impossible to fix its exact ordinal position, as no external resemblance indicates any close relationship to existing genera. Some similarity to a small ostreoid shell renders the genus Wilkinsonia readily recognized among other fossils. It has received a record in the documents of the Victorian Mines Department, though not yet found in our Colony; because as this plant proves to be coeval to the series published by us here, it is likely that also this new addition will be traced yet to localities within our Colony. It is thus also proved that the fossil treasures of that particular tertiary period, the upper pliocene, to which we have added already many significant forms, are as yet by no means exhausted.

Ochthodocaryon—*F. von Müeller.*

Fruit large, globular or verging into an ovate form, sometimes compressed, one-celled, indehiscent, closely verrucular outside, almost smooth inside; pericarp, woody, almost bony, of considerable thickness; septa, none; seeds, unknown.

This genus approaches in warty roughness and somewhat recticular outer plicatures of the pericarp to Phymatocaryon, but the valveless structure brings it much nearer the Plesiocapparis. It may indeed merely form a section of that genus, but the pericarp is harder, and also deeply wrinkled, by which means the fruit assumes a very different aspect. The absence of seeds forbids to trace farther any affinity to Plesiocapparis, and likewise prevents to fix the ordinal position of this fossil. There is a great external resemblance to Xylocaryon, but the cavity of the fruit shows no traces of any ridges, interponent to the lobes of a large seed.

Plate IV, Figs. 1 and 2.

Ochthodocaryon—*Wilkinsonii.*

Two specimens only of this fossil were obtained, each representing a somewhat peculiar form—the one spherical, and of nearly 2 inches measurement, the other roundish, oval, and compressed, measuring 1½ inch.

Illicites—*F. von Müeller.*

Fruit starlike, expanded, consisting of eight carpels, these radiating in one series, cormate towards their oval base, thence free and gradually pointed, rather flat at the lower side, very convex on the upper side, there longitudinally dehiscent, also lengthwise wrinkled and streaked as well as slightly tubercular; vertex of the axis excavated; seeds, unknown.

So far as the material for examination extends it might induce us to place this organic relic into the genus Illicium of the living vegetation, but as nowhere else any species of that genus has as yet been found in a fossil state it was deemed safer, in accordance with palæontographic usage, to frame a separate generic type of similar wording for the fossil probably allied plant. Flowers and foliage as well as perfect seeds would also be needed to establish this fossil an undisputed position in Illicium. As an addition to the magnoliaceæ of past geologic periods this plant is of particular interest, fossil remnants only of the genera magnolia and liriodendron being hitherto from this order on record; these again mainly of the cretaceous epoch, and indeed doubtful in many instances, being often described from leaves merely.

Plate IV, Figs. 3 and 4.

Illicites Astrocarpa.

The only fruit seen about half as large as that of Illicium anisatum, the carpels also more acutely attenuated. It differs from Illicium Floridanune, if a comparison is at all admissible, likewise in small fruitlets of lesser number, not suddenly beaked, while from both it is readily separated by the fruit being convex on the upper not on the lower side, and by its not being smooth.

Plate IV, Fig. 5.

Plesiocapparis Leptocelyphis.

Fruit comparatively small, globular, more or less compressed, slightly oblique; pericarp very thin, outside smooth; seeds, almost oval or roundish, somewhat curved, at least on one side smooth, with a short, perhaps strophiolar or radicular, protrusion.

Clear evidence is wanting for the generic position of the plant yielding this fruit. Should future researches establish it as a separate genus then the specific name above given might be adopted for the genus.

Length of the whole fruit from about 1 inch to nearly 1⅓ inch. Thickness of pericarp about ⅓-line, not much more; seeds, ⅓–½-inch long.

PLATE III.

Fig. 1.—SPONDYLOSTROBUS SMYTHII, *var. Cryptaxis.*

a Side view of fruit.
b Apex of same, showing five valves.
c Apex of a six valved variety of same species.

Fig. 2.—EISOTHECARYON SEMISEPTATUM.

a Side view of fruit.
b Base of same.
c Side view of a slightly compressed form.
d Interior view of same, showing seed cavity.

Fig. 3.—PHYMATOCARYON BIVALVE.

a Anterior view of fruit, showing the valves partly open.
b Apex of same, showing seed cells.
c Side view of same.
d Interior view of one valve, showing seed cavity.
e Side view of fruit, exhibiting two prominent tubercles.
f, g Side view of apex of a compressed form, showing prominent ridge.

Fig. 4.—WILKINSONIA BILAMINATA.

a Side view of fruit.
b Marginal view of same.

Fig. 5.—UNIO AUCKLANDICUS, *var. Wilkinsoni, var. nov.* (See Appendix D.)
All natural size.

PLATE IV.

Fig. 1.—OCTHODOCARYON WILKINSONI.

a Anterior view of an oval and compressed form of fruit.
b, c Base and transverse section of same.

Fig. 2.—*a, b* Anterior view and base of a larger and spherical form of fruit.
c Transverse section of same fruit.

Fig. 3.—ILLICITES ASTROCARPA.

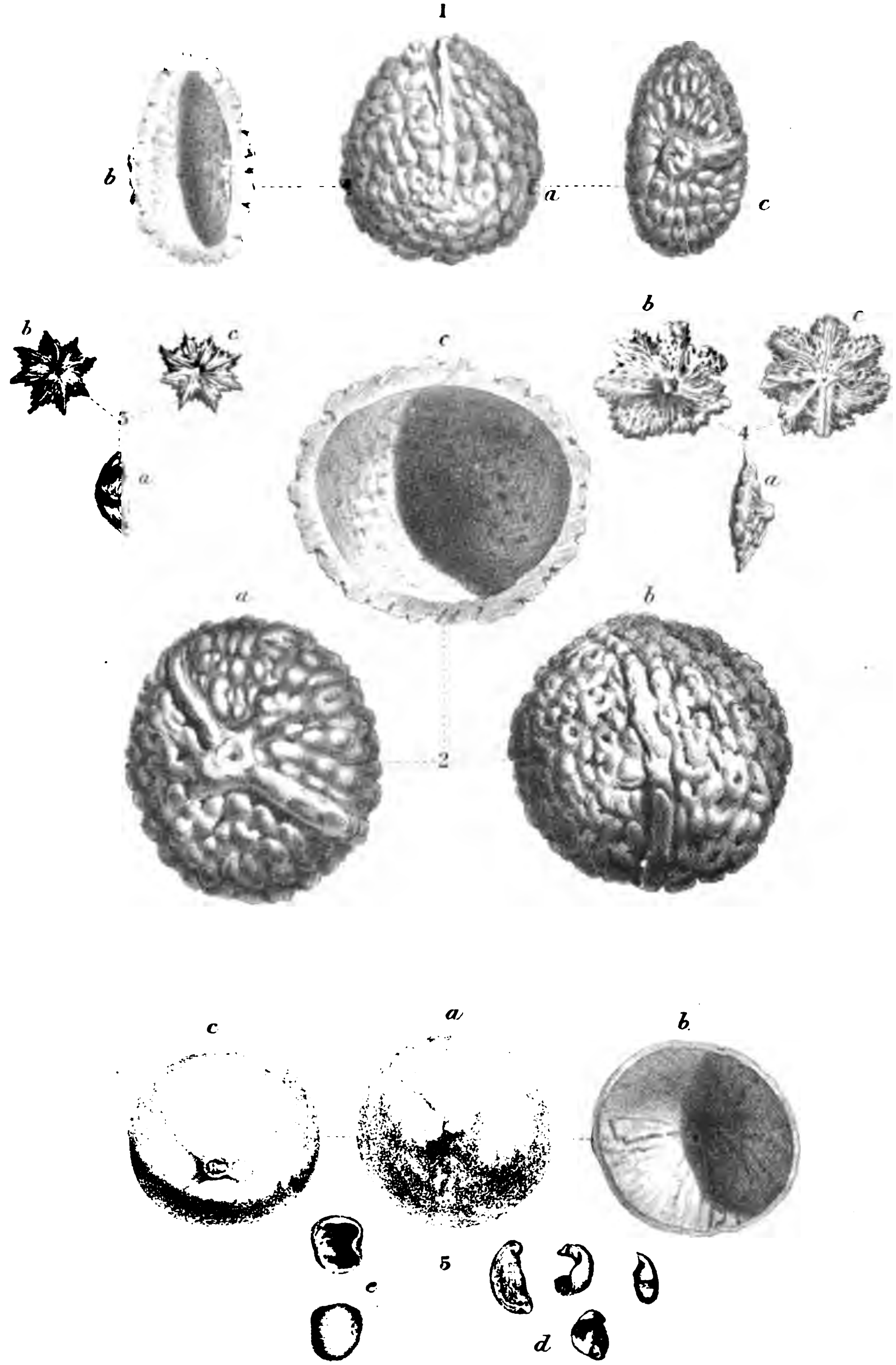
a Side view of fruit.
b, c Base and apex of same in view.

Fig. 4.—*a, b, c* Side view, base and apex of a large form of fruit.

Fig. 5.—PLESIOCAPPARIS LEPTOCELYPHIS.

a, c Views of apex and base of fruit.
b Transverse section of same fruit.
d, e Views of seeds.
All natural size.

[Two plates.]



Arthur J. Stopps del. et lith.

Printed at the Surveyor General's Office Sydney

APPENDIX E.

LIST OF DONATIONS to the Museum of Mines during the year 1878.

Contributor.	Contributions.	Where from.
Mr. J. L. Nickol	Plumbago slate	Nattai.
Mr. Warden Sharpe	Collection of brachiopoda	Capertee.
Mr. J. Carter	Auriferous quartz	Near Rockley.
Mr. L. Harrison	Mispickel	Marulan.
Hon. J. Lucas	Green carbonate of copper, and granite and marl	Murrumbidgee.
Rev. Mr. Lawes	Quartz, manganese	New Guinea.
Messrs. Mason Bros.	Black sand with gold, found by Mr. Goldie	Do.
Mr. Warden Dalton	Auriferous specimens	Barmedman.
Mr. Joseph Paxton, J.P.	Galena	Ravenswood.
Do.	Ceursite	Peelwood.
Do.	Lode tin	Bolitho.
Do.	Various copper specimens	Peelwood.
Hon. Saul Samuel	Red oxide copper	Cadiangulong, near Orange.
Do.	Silicate of copper	Combing.
Do.	Manganese and cobalt ores	Port Macquarie.
Do.	Sulphuret of antimony	Macleay River.
Mr. Jas. Macdonald	Wood opal	Near Wellington.
Hon. W. H. Suttor	Limonite	Lachlan River.
Mr. S. W. Moore, through Mr. Warden Jas. Buchanan.	Stream tin	Cope's Creek.
Mr. Murray Rogers	Copper ore	60 miles N.W. of Wilcannia.
Mr. Hy. Copeland, M.P.	Basalt	Richmond Lighthouse.
Do.	Sand containing gold and platinum	Richmond R. sea-coast.
Do.	Sedimentary deposit	Do.
Do.	Sulphuret of antimony	Bingera.
Do.	Wood opal	Between Richmond and Tweed Rivers.
Do.	Quartz crystals	Peel River.
Mr. Orchard	Coal	Berrima.
Do.	Devonian conglomerate	Upper Patterson.
Do.	Copper, gossan and galena	Belmore, Monaro.
Do.	Galena	Quedong, do.
Do.	Copper ore	Cootalantra Mine, do.
Mr. Bartlet	Copper ore and native copper	Rockhampton.
Hon. E. A. Baker	Titanic iron	Wagga Wagga.
Mr. Langley	Basalt and aboriginal tomahawk	Mount Manning.
Mr. D. Grove	Stanniferous cement	Karoola Mine, Inverell.
Mr. T. Jones	Tin ore and fossil wood	do. do.
Mr. Hanley, M.R.	Auriferous specimens	Stony Creek District.
Mr. R. D. Fitzgerald	Olivine	Mount Gambier, South Australia.
Mr. Crewes	Clay	Bourke.
Mr. J. Foster	Obsidian and carnelian	Gurley Run, near Moree.
Mr. E. F. Pittman	Lepidodendron and various altered rocks	Barrington Diggings.
Mr. Cheesborough	Kaolin	Near Barraba.
Mr. Little	Magnesite and ironstone	Scone.
Mr. Warden De Boos	Various auriferous specimens	Mount Dromedary.
Do.	Iron pyrites	Major's Creek.
Mr. R. A. Eccleston	Auriferous quartz	Peep-o'Day-Reef, Ournie.
Mr. E. Marriott	Auriferous quartz	Glen Morrison.
Mr. Campbell, L.S.	Collection of miocene fossils	Murray River.
Do.	Wood, 40 feet below river bed	Echuca.
Do.	Fossil wood	Singleton Bridge cutting
Do.	Favosites, strophomena, &c.	7 miles above do.
Do.	Roots encrusted with lime and sand	Middle Harbour.
Mr. P. Power	Black corundum	Between Bingera and Glen Innes.

List of Donations—*continued.*

Contributor.	Contributions.	Where from.
Mr. P. Power	Kyanite	Bingera.
Capt. Bruno	Slate, granite, and greenstone	Discovery Bay, New Guinea.
Mr. W. H. Westley	Fine tin saved by new dressing-machine	Vegetable Creek.
Mr. Clements	Calcite, lydian stones, agate, pebbles of quartz, sandstone and porphyry, silicious sinter obscure from impressions in gray shale, petrified wood, silicious rock containing fern impression.	Namoi River.
Mr. C. Robinson	Speigel iron	Germany.
Do.	Felspar	Do.
Mr. J. H. Clarke	Wood opal, petrified wood, iron pyrites	Home Rule.
Mr. P. N. Trebeck	Steatite	Liverpool Range.
Mr. Robt. Scott	Toadseye tin	Grenfell.
Mr. H. Scott, P.M.	Agate and calcareous crystals	Near Singleton.
Major Wells, C.E.	Lepidodendron	Namoi River.
Do.	Spirifer, &c.	Cambewarra.
Mr. W. H. Gill	Auriferous quartz	Barrington.
Mr. W. C. Renwick	Various copper ores	Cobar.
Mr. E. J. King	Sulphurate of antimony	Macleay River.
Mr. Warden Graham	Silver ores (various)	Boorook.
Captain Hutton	Bones of dinornis	New Zealand.
Do.	Collection of geological specimens	Do.
Smithsonian Institute, New York	Columbian	America.
Mr. Blomfield	Limestone	Near Liverpool.
Mr. Hackett	Kerosene shale	Murrurundi.
Mr. H. A. Thompson	Lode tin	Tasmania.
Mr. P. Pierce	Iron pyrites	Head of Clarence River.
Mr. J. M. Brady	Auriferous surface stone	Bungendore.
Mr. Perkins	Various auriferous and argentiferous specimens	Southern District.
Mr. Lorentson	Antimony ores, magnetite and brown oxide of iron	Macleay River.
Mr. Thos. Horton	Various silver ores	Boorook.
Mr. Thew	Tooth of diprotodon, Australis	Canadian Diggings.
Do.	Coralline limestone	Do.
Mr. Lowe	Cast of bones in tin found in bed of tin furnace and pebble.	Pyrmont Works.
Mr. E. R. Deane	Vesicular quartz, containing mispickel	Marulan.
Do.	Ferruginous quartz	County Argyle.
Do.	Limonite, limestone, specular iron, galena, and blende.	Do.
Do.	Quartz sand cemented by iron pyrites	Shoalhaven Gold-field.
Mr. Sörenson	Iron ore and copper regulus	Near Hilston.
Mr. Moore	Quartz from surface	Wallaroo.
Mr. Church	Various specimens pyrites stone	Ironclad Reef, Cargo.
Mr. O'Shannassy	Lepidodendron	Cowra.
Do.	Limestone containing bivalve shells	Do.
Do.	Ironstone	Near Cowra.
Mr. J. Masters	Auriferous stone	Long Swamp Forest, near Orange.
Mr. McGlue	Iron ores	Bungonia.
Do.	Limestone	Near Bungonia.
Do.	Calc spar	Wollongong.
Do.	Cannel coal	Sutton Forest.
Do.	Pyritous quartz, hornstone	Bungonia.
Do.	Pentamerus	Goulburn.
Do.	Ore of cobalt and manganese	Near Bungendore.
Mr. P. King	Lepidodendron	Goonoo Goonoo.
Mr. P. Wilson	Hæmatite	Narrandera.
Mr. Jas. Main	Tertiary leaves	Dalton, near Yass.
Mr. A. H. McCulloch, M.P.	Gleichinites odontopteroides	Mount Piddington.
Mr. Jones	Ironstone	Mount Keira.
Mr. Warden Martin	Silver ore	Near Glen Innes.

LIST OF DONATIONS—*continued.*

Contributor.	Contributions.	Where from.
Mr. H. Cambridge, L.S	Chert, gypsum, talc, quartz crystal, quartz and hæmatite.	Near Hay.
Mr. Simmons	Titanic iron, magnetite and zircons	Rocky River.
Mr. J. K. Hume	Collection of silurian fossils	Yass Plains.
Do.	Collection of tertiary leaves	Dalton, near Yass.
Mr. T. W. Capel	Blende and cubical pyrites	Adelong.
Mr. Ed. Hill, J.P.	Opal	Near Braidwood.
Mr. J. Whitton	Pyritous quartz; marble limestone, specular iron, sulphuret of antimony, plumbago clay, quartzite, iron ore, pyritous quartzite, sandy clay rock, ferruginous garnet rock.	Surveyed Railway Line between Grafton and New England.
Mr. F. Smith	Various fossil fauna	Wollongong Dock.
Mr. Warden Rowling	Specimen of quartz	Barrington.
Mr. Warden Brougham	Auriferous specimens	Bingera.
Do.	Kaolin	Do.
Mr. Montague	Stone supposed to be auriferous	Near Peelwood.
Mr. Wilshire	Coal	Near Berrima.
Mr. C. Moore	Vertebraria	Hartley Vale.
Mr. C. F. Smith	Inflammable clay	Near Wollongong.

APPENDIX F.

Geological Survey Camp, near Murrumburrah,
13 October, 1878.

Sir,

I beg to furnish you with a sketch map showing the general geological features of the most northern of the gold-field reserves, situated in the county of Harden.

I may state at once that the portions representing alluvial include both the older tertiary and recent deposits. To have separated these would have required a considerable amount of valuable time, and as my object is to show the position and extent of the gold workings I did not think such detail was necessary.

It will be seen that the alluvial has been worked almost exclusively in the north-western portion of the reserve, and that the workings have been of very considerable extent. This may have been due to the large number of miners that were in the vicinity when the rush to the field took place, and doubtless many of the claims did not pay, and were abandoned after being bottomed; but as at the present time the re-working of the old ground by sluicing pays very well when there is a sufficient supply of water, I am of opinion that the gold must have been pretty widely scattered through the alluvial. From what I have seen of the gold and tailings from this locality I believe the former was derived from two sources. Firstly, from small veins of quartz in the granite, and also from the latter itself; and, secondly, from an old lead that has been redistributed. What confirmed my opinion that there has been such a lead was finding within three-quarters (¾) of a mile of the summit of the range of hills forming the watershed between the counties of Monteagle and Harden a number of quartz pebbles so rounded as to form almost perfect spheres, thus showing an amount of abrasion they could only have received during a passage of many miles in the bed of a watercourse. With these old drift-pebbles were mixed subangular blocks of quartz and euritic granite.

It is curious to observe the position of the chief workings in this field, and I think that with some prospecting it could be determined whether there is any connection between the patches, or whether they only occur where the alluvial drains from the immediate vicinity of auriferous granite. It must of course be a matter of great interest to both miner and geologist to be able to distinguish the auriferous from the non-auriferous granite; and it is with extreme regret that I have to say that, in spite of having examined numerous outcrops of granite, I have been unable to perceive any difference, except one, which I will mention further on, but whether this latter bears on the point in question I cannot say. I would advise the careful examination of samples of granite from various localities—first chemically, and then microscopically. The difference that I referred to a few lines above consists in the varying hardness of the granite formation, and which is magnificently shown in the railway cuttings to the west of Murrumburrah. Here at first sight a person sees what he takes to be hard granite boulders buried in soft alluvial, but in several places, and especially near the bridge where the road from Young to Murrumburrah crosses the railway line, a closer inspection will show veins of quartz running in comparatively unbroken lines from top to bottom of the cuttings, and lying entirely in what appears to be alluvial, but which is in reality the soft variety of granite. That granite should be decomposed near the surface of the earth, where exposed to the chemical and mechanical attacks of the atmosphere and rain, is only in the order of things, but that in the same locality granite masses of very unequal durability of texture exist is conclusively shown both in the case of this cutting and also all over the reserve, by the numberless granite bosses that lie high above the present surface of the soil. In these masses of hard granite I have not as yet noticed quartz veins of any appreciable thickness; but I state this with the reservation that sufficient examination has not yet been made to permit the conclusion that such is always the case.

It would perhaps not be amiss to describe the granite in this neighbourhood. It is a large-grained gray granite, composed of black mica (biotite), transparent quartz, and white felspar (orthoclase). Like the granite about Young and Cowra, it contains small masses of quartz and concretions of mica, the latter sometimes looking like pieces of mica schist. The softer variety of granite contains enough iron to rapidly tinge it pink, and the soil derived from it is of a dark red colour, though in some parts of the reserve the soil is of a much lighter colour than in others, this being the case in the eastern portion of the parish of Moppity; but here I believe it is largely due to another cause, which I will mention further on. The granite is traversed by veins of euritic granite, the latter being harder than the containing rock, and having white mica (muscovite) instead of black. The arrangement of the crystals in the euritic granite sometimes gives it the appearance of graphic granite, and there are also sometimes crystals of shorl present. These eurite veins are sometimes of very considerable size.

Besides the numerous quartz leaders that run through the granite in all directions there are also some veins of a size and nature such as to constitute them reefs. There are three or four such reefs which have been slighly prospected; but in every case, though the stone near the surface was reported to average from 5 (five) dwts. to as high as 15 (fifteen) dwts. of gold to the ton, they have all been abandoned. Such must always be the case where poor reefs are worked by miners without capital, or, in other words, where from the onset mining ventures are expected to pay the working expenses and also a profit to the proprietors. It is bad enough that two or three miners should spend their little all and waste valuable time in this manner; but the chief evil resulting therefrom is that having had one or two small shafts sunk on it the reef is regarded by speculators as a failure, and should any one take it in hand, the old shafts are a source of annoyance and often expense. Personally I do not believe that good auriferous reefs are likely to occur in mid-granite that is distant some miles from sedimentary, altered, or intrusive rocks; and the metamorphic strata that are found more in the south and south-east of the county of Harden are some distance from the reefs in this reserve. I have seen in Spain very fine lead lodes in granite, and distant often 3 (three) and even 4 (four) miles from the slate rocks; but the number of lodes was very great, there were numerous cross-lodes, and the matrix of the former was largely composed of soft minerals, crystallizing so as to leave open spaces between the crystals, such as fluorspar, carbonate of lime, &c., and not the dense solid quartz that is generally found composing these reefs in the granite—the rationale of the above being that the circulation of mineral waters in the case of quartz reefs is small as compared with the other case cited.

Through the courtesy of Messrs. Harris and Barnes I was pointed out three reefs near Murrumburrah that had been worked at in the manner I have indicated in the preceding paragraph. They are as follows:—The Louisa Reef, situated about 3 miles from Murrumburrah, along the road to Cootamundry, on which three shafts have been put down, only one of which is worth mentioning, having been sunk to a depth of 10 fathoms. The width of the lode at the surface is from 14 to 20 inches, and when last seen in the shaft is reported to have been 2 feet 6 inches. The reef bears W.N.W., and is vertical. The quartz is solid white opaque, and the yield of gold was estimated to be 8 dwts. to the ton. Another lode on the left bank of the Demondrille Creek, about 1 mile above the crossing of the said creek by the road to Cootamundry, has had some 20 tons taken from it and crushed, the yield being 15 dwts. to the ton. The width of stone was 12 inches, and in appearance it was slightly better than that of the Louisa; the bearing of the reef was W.N.W., with a slight dip from the vertical to the N.E. This reef is said to be on private ground, and was abandoned owing to the high terms required for permission to work it. I was shown another place in the S.E. corner of the reserve on the right bank of the Demondrille Creek where two "blows" of quartz had been slightly picked at, and the colour of gold reported to have been found.

Adjoining the gold-mining reserve in the parish of Wombat, on the south, is a reef that has been sunk on to a slight depth, but with no satisfactory results. I heard some of the miners speaking well of it, or rather of their hopes of its turning out well, but I could see no foundation for such beyond the presence of a good deal of alluvial gold in the vicinity. A little to the N.W. of the village of Wombat, and near a gully known as Bullock's Head Gully, I saw the remains of a shaft that had been sunk on a reef, but I could get no information about it beyond that it did not pay, though very rich alluvial gold was extracted from the gullies round it.

It will be seen by the sketch map that the summit of the Dividing Range in the N.E. of the parish of Moppity is of sandstone strata of devonian age, and the locality is interesting from the apparent gradual change from sandstone into granite. Near the summit of the range the sandstone is white, fine-grained, and yields easily to the knife; the bedding is apparently horizontal, though there appears to be a slight dip to the N.W.; lower down the slope of the range the sandstone becomes harder, and presents at last a single silicious face; this seems to change into a curious quartz rock, apparently composed of a number of separate crystal-like particles quite white in colour, and at one place, as shown on the sketch map, there seemed to be a bed of solid white quartzite resting on the granite. These were the only portions of the section I saw, though I tried hard to find a situation where the junction of the quartzite with the granite was shown.*

The alluvial in the gullies draining from these sandstone ranges is very soft, and the small creeks have cut their narrow watercourses to depths of 30 and 35 feet, resembling the tail-races from a sluicing claim.

It may be interesting to give some statistics of the earnings of the miners that I noted during the course of a Warden's Court held by Mr. Warden Robinson. Williams and party, a sluicing claim on the gold-mining reserve, parish of Wombat; three men working for twenty-three days; amount of gold on washing-up, 37 ozs. 4 dwts. The claim is on old workings, and the whole height of the alluvial is taken down some 8 feet. Some of the previous yields have been larger; on one occasion 65 ozs. of gold was got in thirteen weeks. There is plenty of ground left, estimated to pay 6d. per load.

Chamberlain & Lyon's claim has paid wages, the ground similar to the above.

Hollice & Co. pay £4 per week a man, ground as above.

Cuthill's claim last washing-up paid £5 9s. 6d. for six days' water, ground as above.

Several other diggers I encountered in various portions of the reserve all told me they could make wages, and occasionally a little more, as long as they had water for sluicing. These men are few in number and poor; they cannot afford to erect dams of any magnitude, and the country has been so taken up by selection that when they do get a little money together they fear to lay it out in expensive dams, as the free selectors have a way of warning them off their land; and until the diggers are pointed out what ground can be got at under the 14th section they must continue in their present spasmodic manner of digging. It is a great pity such men are not more supported, for to them we must look for all future discoveries; they may not be the men to develop the mineral resources of the Colony, but they are essentially the men to discover them.

In conclusion then, I would beg to direct your attention to this want the diggers on this reserve feel—of some simple method by which they can find out what land has been alienated under the 14th clause; and would suggest that the matter might be easily dealt with by having a plan deposited in the Registrar's Office showing the position of all ground taken up under the 14th clause.

I have, &c.,
LAMONT YOUNG, F.G.S., &c.,
Geological Surveyor.

---

* Of these rocks I am forwarding specimens to the Museum.

Recommending that portion of Reserve No. 381 *be declared open to conditional purchase under* 14*th clause.*

Sir, Oaklands, Mittagong, 29 January, 1879.

I had the honor of receiving instructions from the Geological Surveyor in charge to inspect reserve No. 381, parishes of Mulroy and Bingera, County of Murchison, and herewith beg to hand you my report.

This reserve is situated at the mouth of a long narrow valley, through which the Bingera River flows. The hills on either side are of silurian strata, passing in places from a well defined slate into a serpentine rock. At the head of the valley, and for a considerable distance down it, in the direction of Bingera, there are large areas of basalt, and in some localities, as at Bell's Mountain, it must attain a considerable thickness. The slates show very well in the bed of the Gwydir, a little west of the town of Bingera. Their strike here is N. 38° W. with a dip of 43° to the N.E. But this is quite a local strike, as a mile to the northward they run nearly due N. and S. Up Spring Creek, and about 2½ miles from Bingera, there is an outcrop of limestone, with the usual silurian corals, &c.

The reserve is divided into two portions by the river Gwydir, which flows through it from east to west. Near the town it is joined by the Bingera River, flowing nearly due north. The latter only shows water during the rainy season, though there is nearly always some running underground in the bed of the river. The waters from Spring Creek and the gully draining from the Doctor and Jackass Reefs fall into the Bingera River. The northern portion of the reserve is traversed by the Bobby Whitlow Creek, flowing west.

Two main roads enter the reserve on the north, from Warialda and from Inverell. They junction at the town of Bingera, and continue thence as one road to the south. On both sides of the town there are travelling stock reserves along the roads, and they take up a considerable though very necessary portion of the land suitable for agriculture. The whole of the east side of the reserve for a width of 1½ mile is composed of scrubby ranges, and the south-west corner partakes of the same character. The remaining country is flat, open, and occasionally undulating. There is much land taken up along the banks of the Gwydir, to the west of the town, and a large common; and some selections on the banks of the Bingera River still further reduce the area available to be thrown open.

The gold workings in the reserve are not extensive. They are as follows: The Cemetery Lead, south of the town and running in a N. and S. direction (see enclosed tracing), gave employment to about 100 men. The depth of sinking was 15 feet at the top (south end) and 29 feet at the lower end (near the town). It was considered to be the only defined lead in the reserve. Two claims yielded 3½ ozs. to the load, the average yield on the lead being about 2 ozs. to the load. The lead was considered worked out when it was abandoned, and the miners reported the bed-rock to be slate and sandstone. The White Lead was supposed to be a continuation of the Cemetery Lead, bearing west, and yielded ½ oz. to the load. I expect this was merely a tributary lead. "Paint gold" was found about 100 yards from the All Nations Reef, on the western slope; and a gully about 500 yards from the Cemetry Lead, coming into the flat from the south, yielded ½ oz. to the load. The sinking was through clay and drift, from 25 feet to 28 feet, the bottom being slate and sandstone. Some very good gold was got in Spring Creek and the gully draining from the Doctor and Jackass Reefs. The diggings on the Bobby Whitlow Creek seem to have always suffered from a want of water, and occasionally to have yielded good gold. I saw a 2½-ozs. nugget that had been found on this creek within the last twelve months. As these diggings were quite unprotected from alienation I have recommended a reserve along the banks of the creek.

The All Nations Reef was opened eighteen years ago, and sunk on to a depth of 70 feet. The stone did not average ½ oz. to the ton, and it was abandoned. The reef strikes S. 9° W., is nearly vertical, and about 3 feet wide. (The position of this reef is shown on the enclosed tracing.) Just outside the south-east corner of the reserve are the Doctor and Jackass Reefs. The former was worked by one party. They had a small leader 6 inches wide. It did not pay, and was abandoned. The Jackass Reef was also worked by one party. They had a leader from 2 to 6 inches wide, yielding ½ oz. to the ton. It did not pay, and was abandoned.

After a careful examination of the reserve, I have recommended a certain portion of it to be thrown open to conditional purchase under the 14th clause. There remains some land in the south-western portion, but I have thought it undesirable to throw this open, as, in my opinion, a lead will yet be found running through it, and skirting the range of hills before-mentioned.

I visited the Prince of Wales Copper Mine, and went underground, but the lower levels were under water, and I only saw the upper one. The explorations on this outcrop of copper ore, though very encouraging, are not extensive enough to warrant an opinion. Mr. Johnson was sending down some ore to be smelted, and the mine will doubtless be further proved.

In company with Mr. Warden Brougham, I paid a hurried visit to Upper Bingera. The difference of level between the allvuial here and on the reserve is very considerable. There are numerous reefs. One of them, owned by a Mr. Ingram and two Chinamen, has been quite recently opened and some very fine specimens taken out. I expect this reef will turn into a pyrites reef lower down. The strike is N. 70° W., dip 38° 45′ to the south, width about 1 foot. Another reef in this locality, now abandoned and called the Bendigo Reef, was extraordinarily rich for a time. I should also mention Mitchell's Copper Mine, which gives very promising indications, but is not being worked.

I have, &c.,
LAMONT YOUNG,
Mining Civil Engineer,
Late Geological Surveyor.

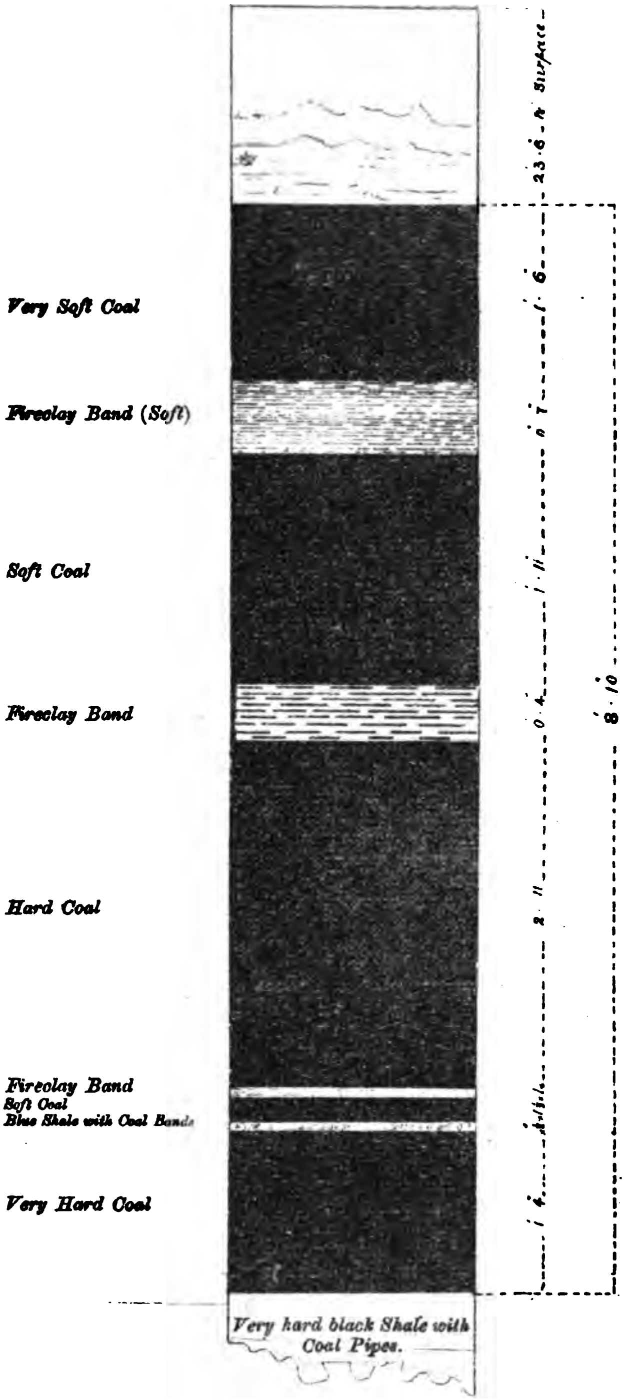
The Under Secretary for Mines.

Sydney: Thomas Richards, Government Printer.—1879.

Nº 1

CHARLES' PIT.

No. 1 Seam.

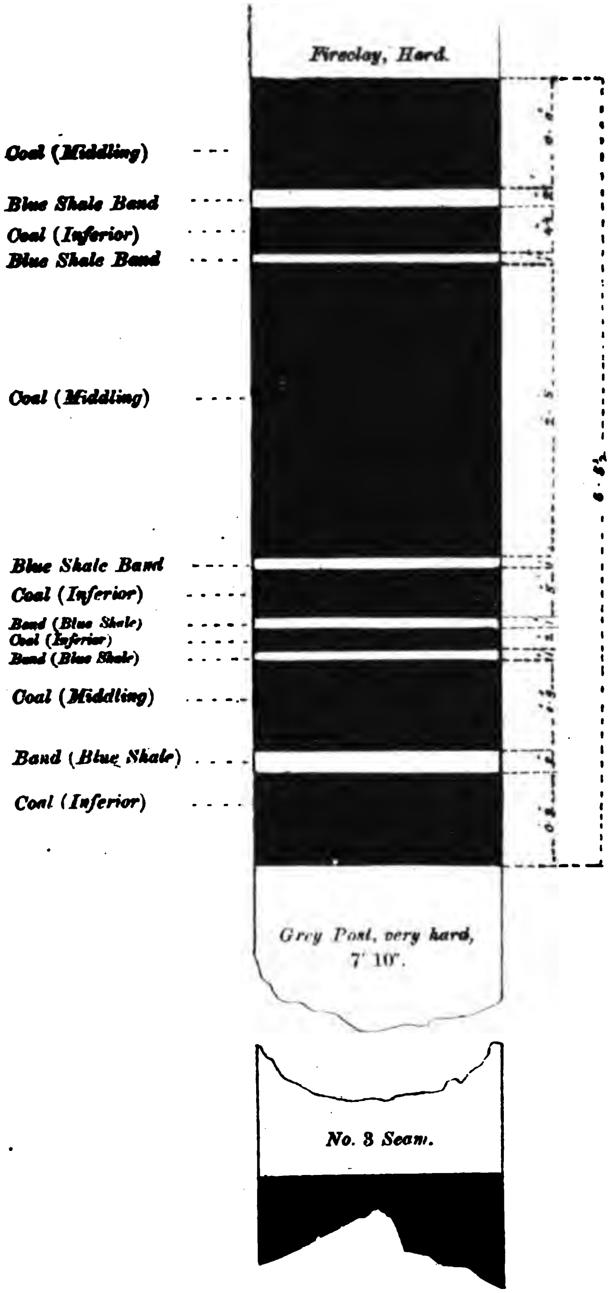


WARATAH C.C.

Nº 2

CHARLES' PIT.

No. 2 Seam. 166 ft. 6 in. from surface.



WARATAH C.C.

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE.
SYDNEY, NEW SOUTH WALES

Nº 3

CHARLES' PIT.

No. 3 Seam. 180 ft. 10 in. below surface.

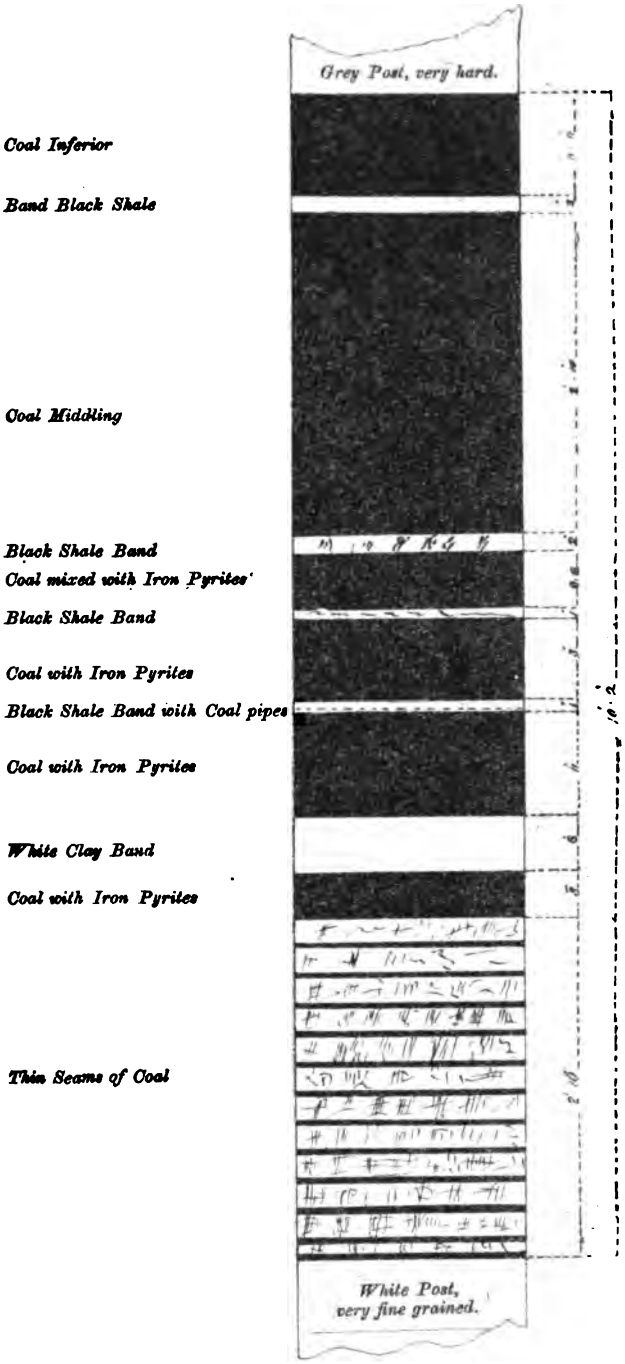


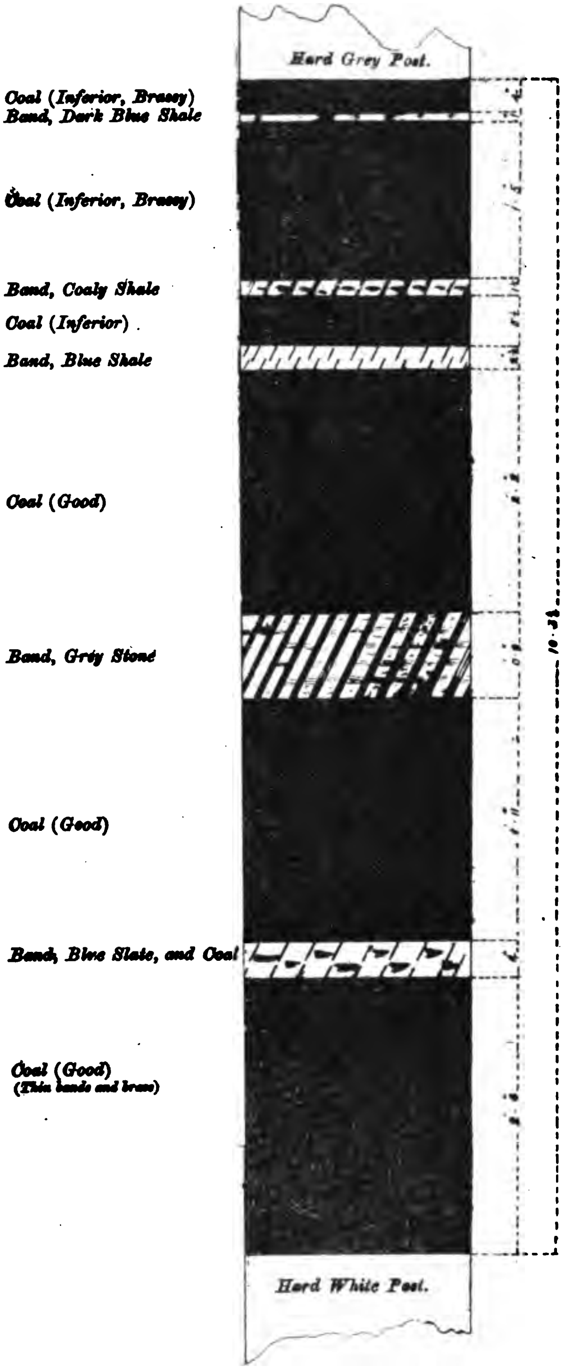
PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE
SYDNEY NEW SOUTH WALES

WARATAH

N° 4

CHARLES' PIT.

No. 4 Seam. 266 ft. below surface.



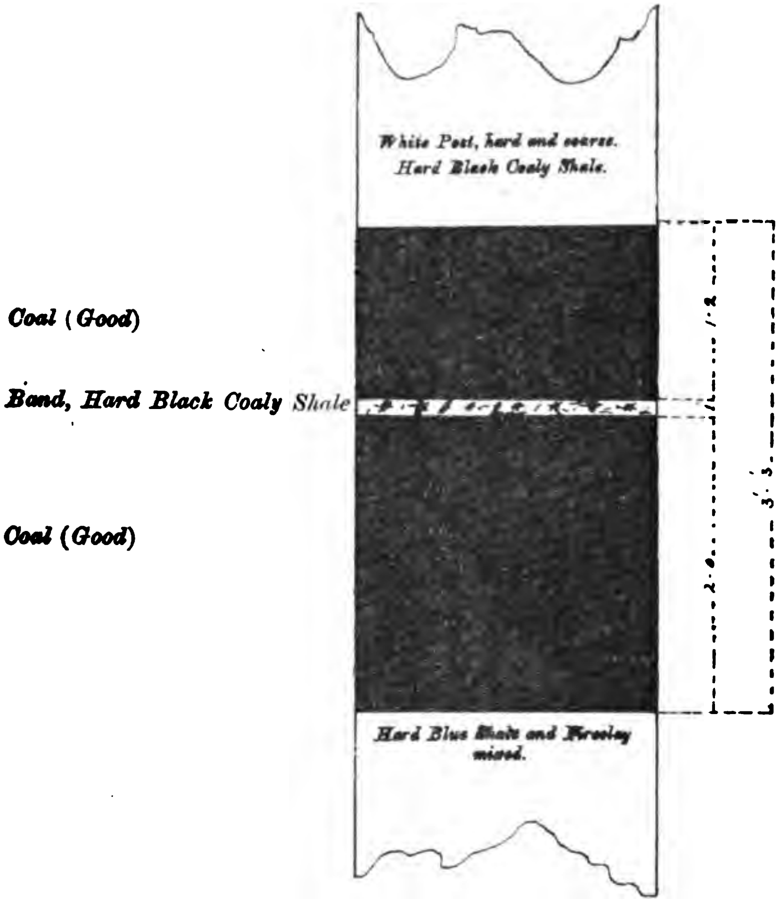
WARATAH C.C.

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

No. 5

CHARLES' PIT.

No. 5 Seam. 314 ft. 7½ in. from surface.


White Post, hard and coarse.
Hard Black Coaly Shale.
Coal (Good)
Band, Hard Black Coaly Shale
Coal (Good)
Hard Blue Shale and Fireclay mixed.
1'·2
2'·0
3'·3

WARATAH C.C.

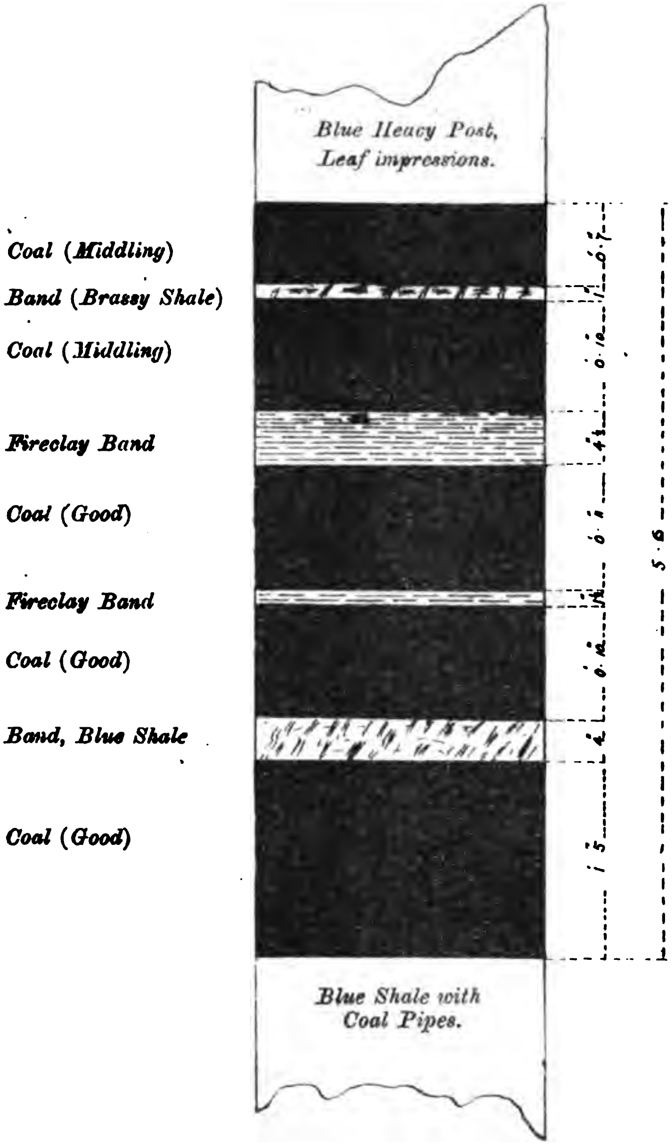
PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

18a 128-79

No. 6

CHARLES' PIT.

No. 6 Seam. 364 *ft.* 4½ *in. from surface.*



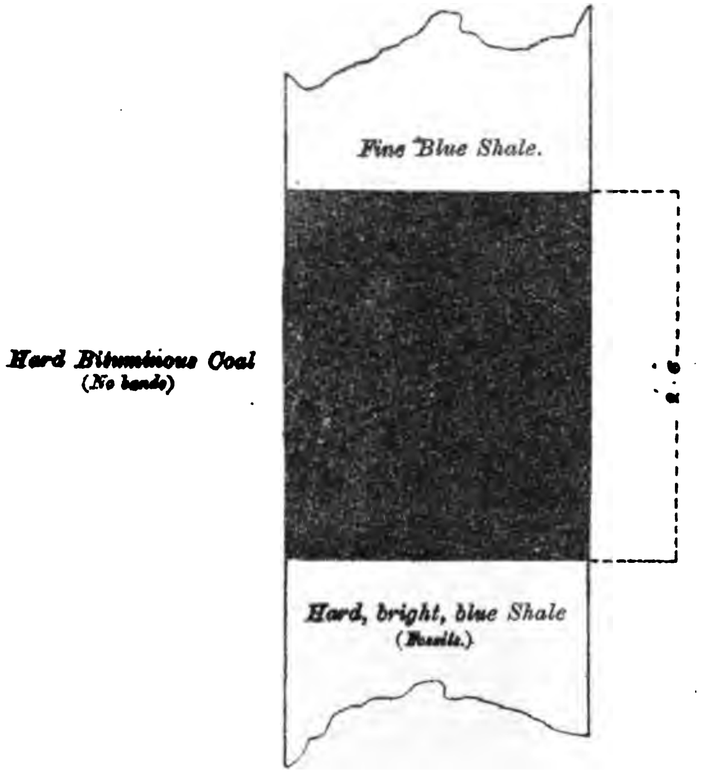
WARATAH C.C.

PHOTO-LITHOGRAPHED AT THE GOVT PRINTING OFFICE
SYDNEY, NEW SOUTH WALES

No. 7

CHARLES' PIT.

No. 7 Seam. 460 *ft.* $2\frac{1}{2}$ *in. below surface.*



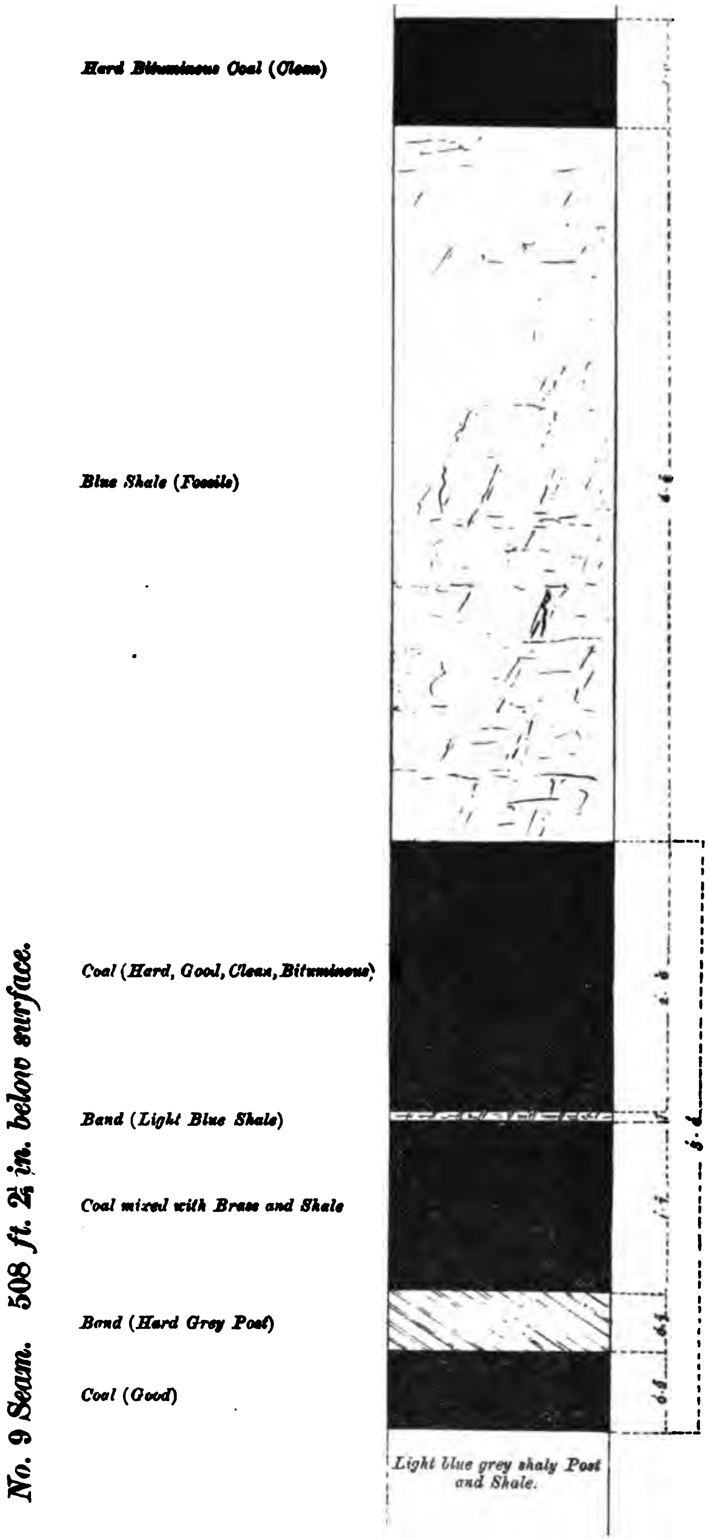
WARATAH C.C.

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE.
SYDNEY, NEW SOUTH WALES.

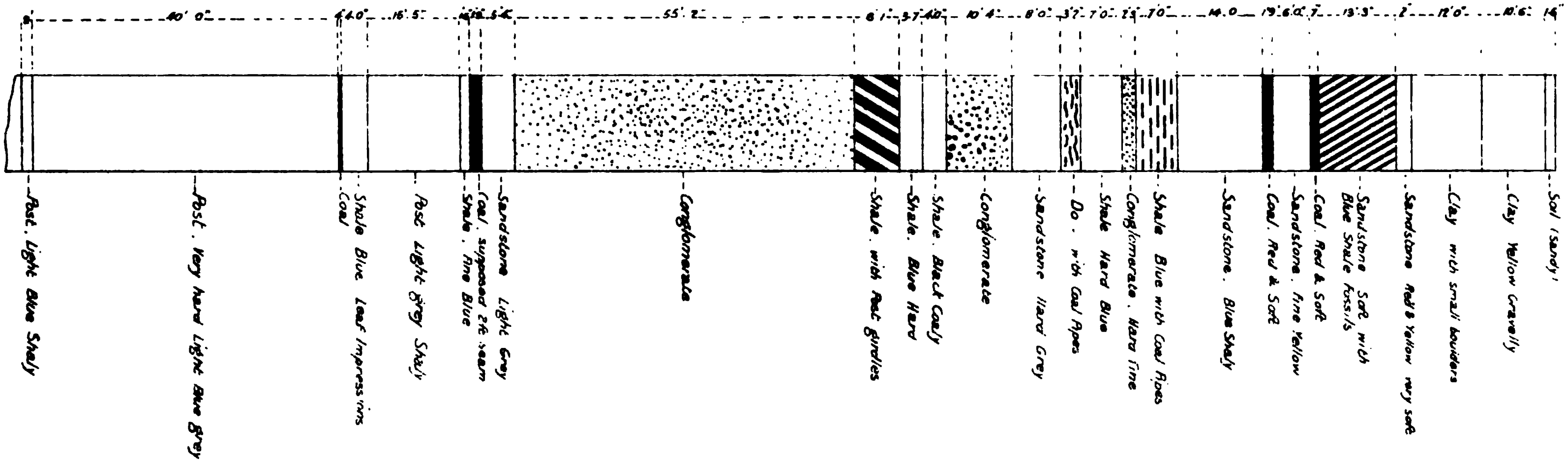
No 8

CHARLES' PIT.

No. 8 Seam. 500 ft. 6½ in. from surface.


Hard Bituminous Coal (Clean)
Blue Shale (Fossils)
Coal (Hard, Good, Clean, Bituminous)
Band (Light Blue Shale)
Coal mixed with Brass and Shale
Band (Hard Grey Post)
Coal (Good)
Light blue grey shaly Post and Shale.
No. 9 Seam. 508 ft. 2¼ in. below surface.
2·6
1·7
0·5
0·8

WARATAH C.C.

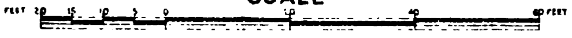


N° e

WARATAH. C.C.

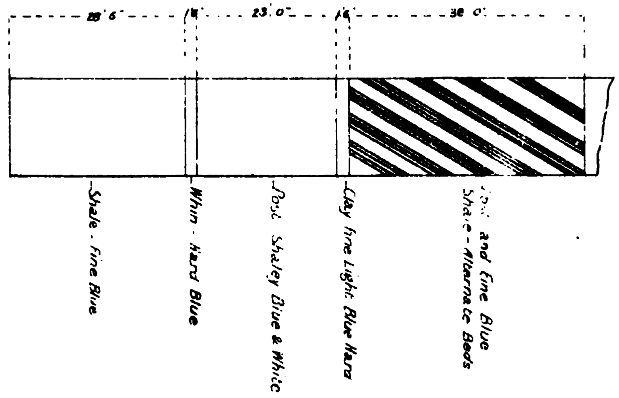
Section of Stuart Pit — Measures

SCALE



Note The depth of the Shaft is 333 feet.

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY NEW SOUTH WALES.



Nº 10

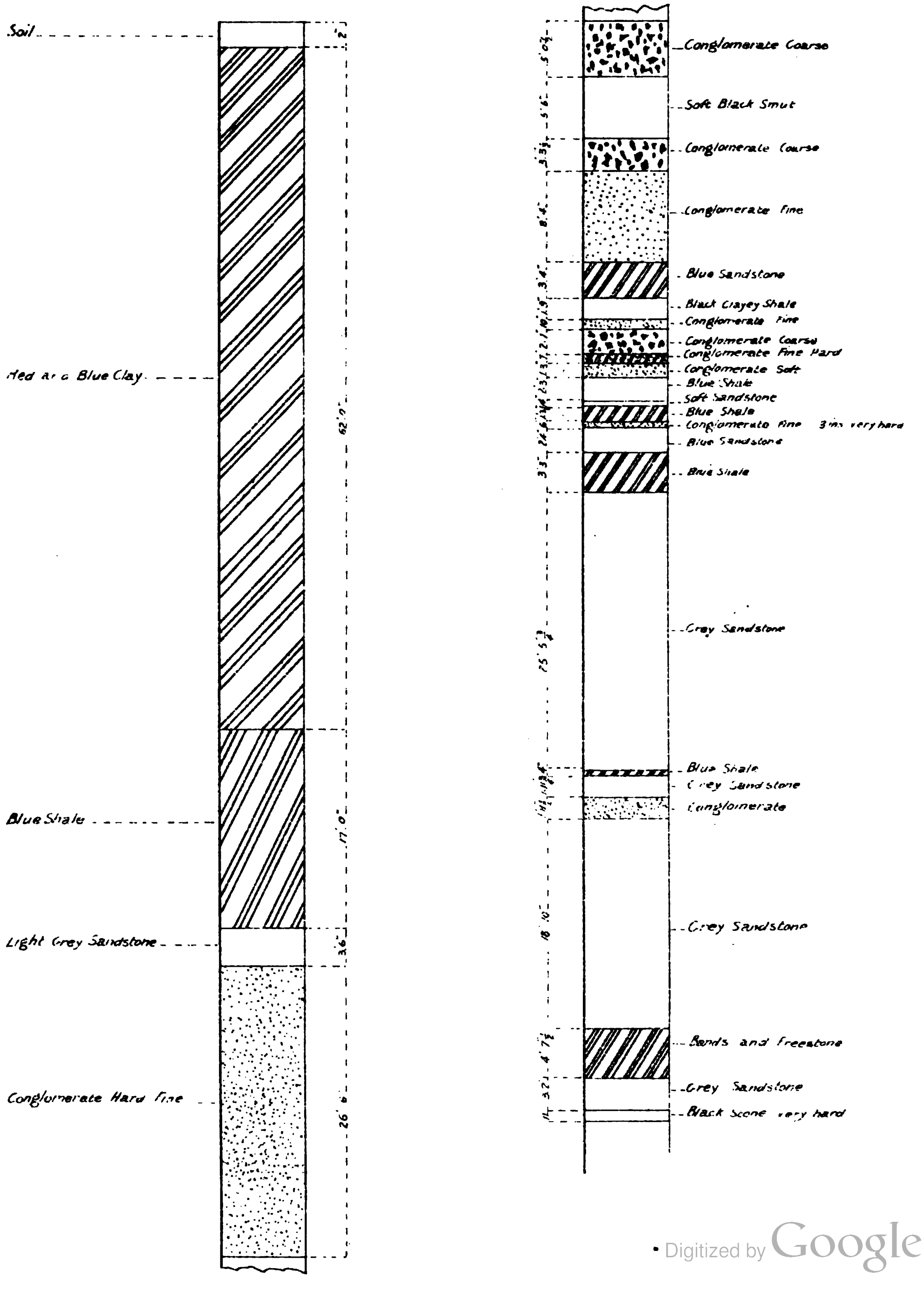
WARATAH. C.C.

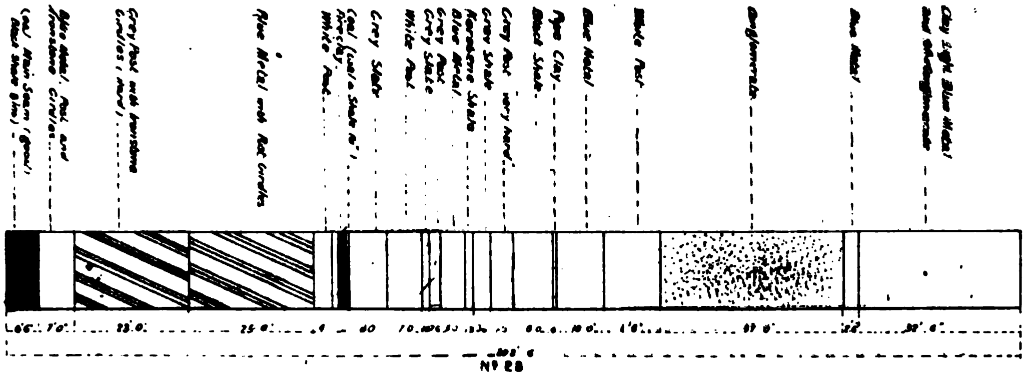
Section of Borehole about 22 chains North of the Stuart Pit in the — Company's Freehold Land —

SCALE

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

Note - Total depth of Bore 210ft 10in




Coal Main Seam (good) Band shale 6 in
Blue Metal, Post and Ironstone Girdles
Grey Post with Ironstone Girdles (hard)
Blue Metal with Post Girdles
White Post
Grey Shale
White Post
Grey Post
Grey Shale
Blue Metal
Ironstone Shale
Grey Shale
Grey Post very hard
Black Shale
Pipe Clay
Blue Metal
White Post
Conglomerate
Blue Metal
Clay light Blue Metal and Conglomerate

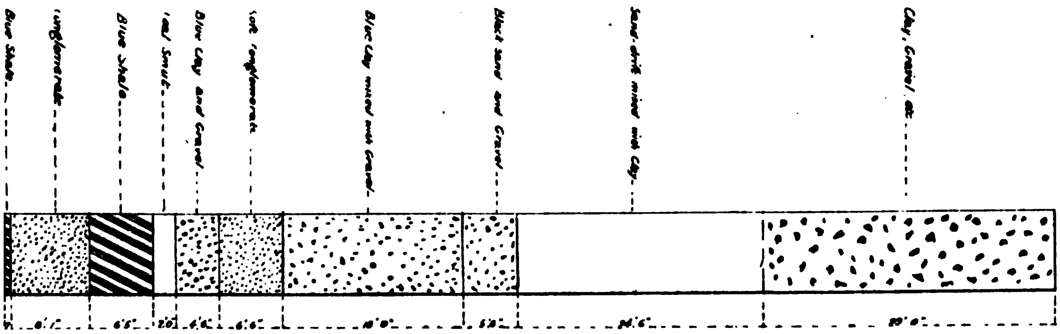
Nº 28

LAMBTON C.

Measures sunk through at the Middle or Water Pit — Old Lambton Colliery

SCALE

PHOTO-LITHOGRAPHED AT THE GOVT PRINTING OFFICE
SYDNEY, NEW SOUTH WALES.



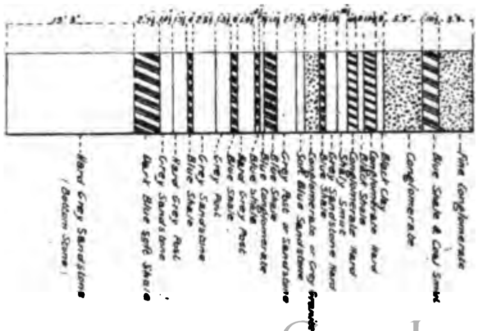
Nº 11

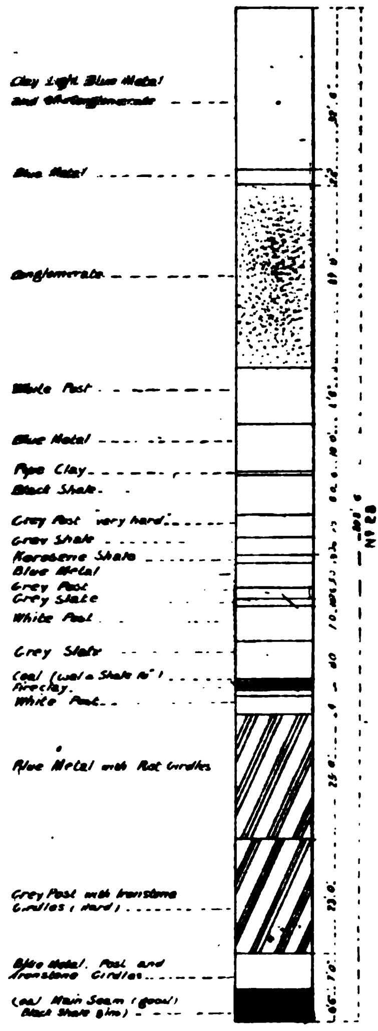
WARATAH C.C.

Nº 2 Borehole John's Farm 10 chains
— S.E. from Brown's Corner —

Note Depth of Bore 153.6

SCALE





Nº 28

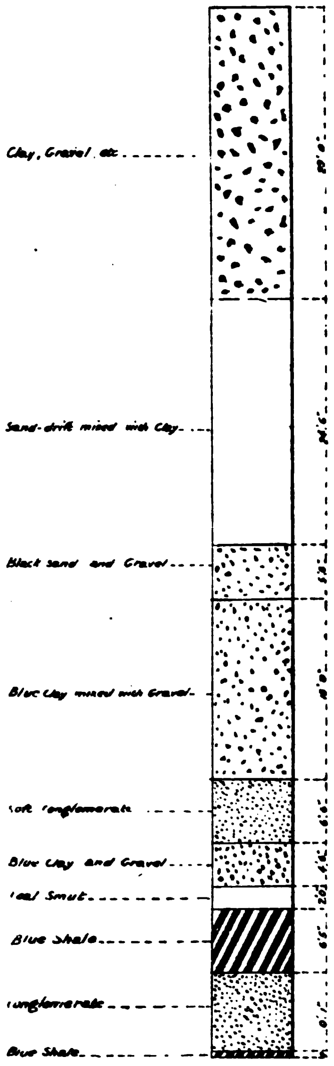
LAMBTON. C.

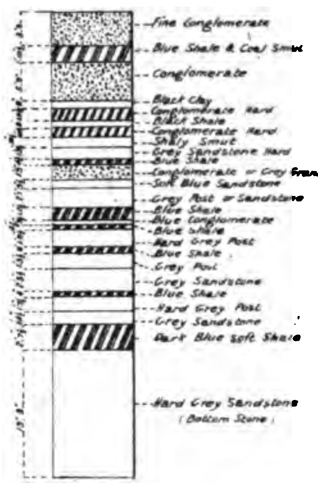
Measures sunk through at the Middle or Water Pit — Old Lambton Colliery

SCALE

FEET 20 15 10 5 0 20 40 60 FEET

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE
SYDNEY, NEW SOUTH WALES.





Nº 11

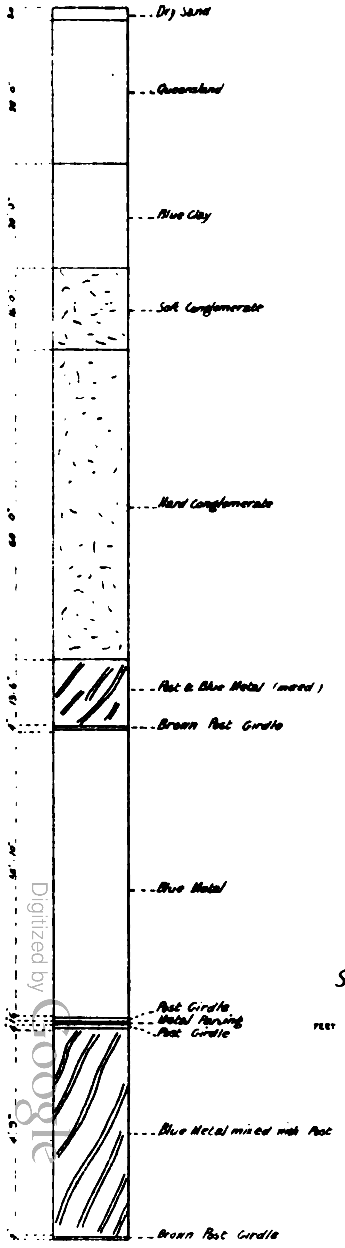
WARATAH. C.C.

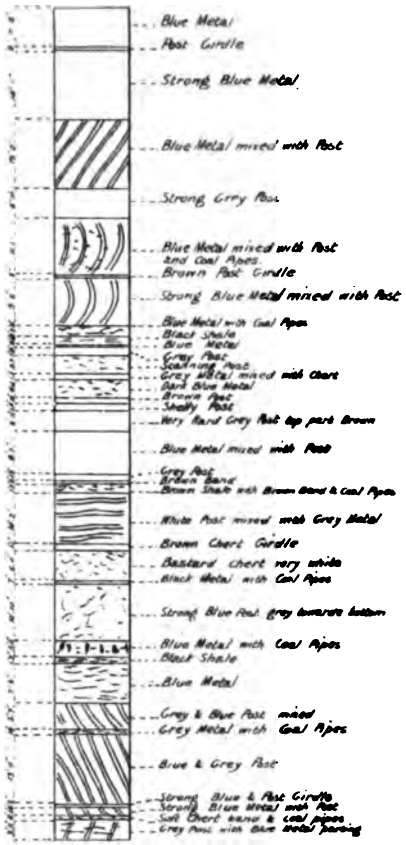
Nº 2 Borehole John's Farm 10 chains
— S.E. from Brown's Corner —

Note Depth of Bore 153' 6"

SCALE

FEET 10 5 0 10 20 30



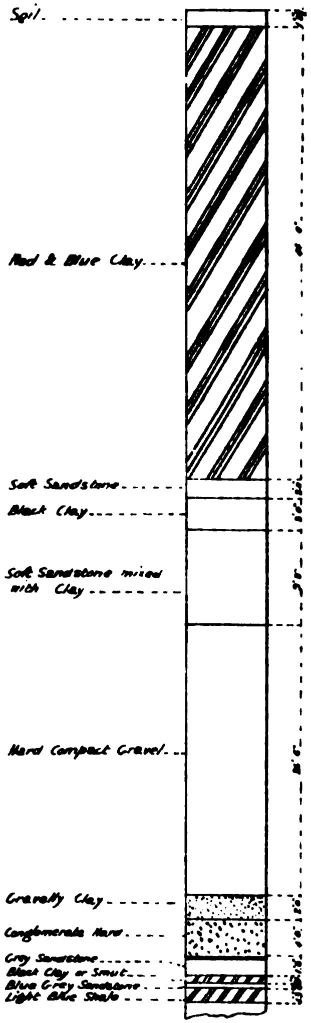

Blue Metal
Post Girdle
Strong Blue Metal
Blue Metal mixed with Post
Strong Grey Post
Blue Metal mixed with Post and Coal Pipes
Brown Post Girdle
Strong Blue Metal mixed with Post
Blue Metal with Coal Pipes
Black Shale
Blue Metal
Grey Post
Scanning Post
Grey Metal mixed with Chert
Dark Blue Metal
Brown Post
Shelly Post
Very Hard Grey Post top part Brown
Blue Metal mixed with Post
Grey Post
Brown Band
Brown Shale with Brown Band & Coal Pipes
White Post mixed with Grey Metal
Brown Chert Girdle
Bastard chert very white
Black Metal with Coal Pipes
Strong Blue Post grey towards bottom
Blue Metal with Coal Pipes
Black Shale
Blue Metal
Grey & Blue Post mixed
Grey Metal with Coal Pipes
Blue & Grey Post
Strong Blue & Post Girdle
Strong Blue Metal with Post
Soft Chert bands & coal pipes
Grey Post with Blue Metal parting

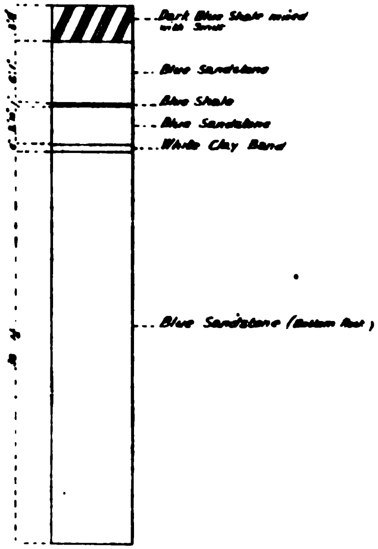
Total Depth of Bore 363ft 10in
N° 4

WARATAH. C.C.

Section of Borehole near Loco Tank

SCALE





Depth of Bore 149ft 7in
N° 12

WARATAH. C.C.

N° 3 Borehole about 30 chains E from
New Lambton Pit in the Company's Leased Land

SCALE

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE.
SYDNEY, NEW SOUTH WALES.

N° 13

WARATAH C.C.

New Tunnel Seam.

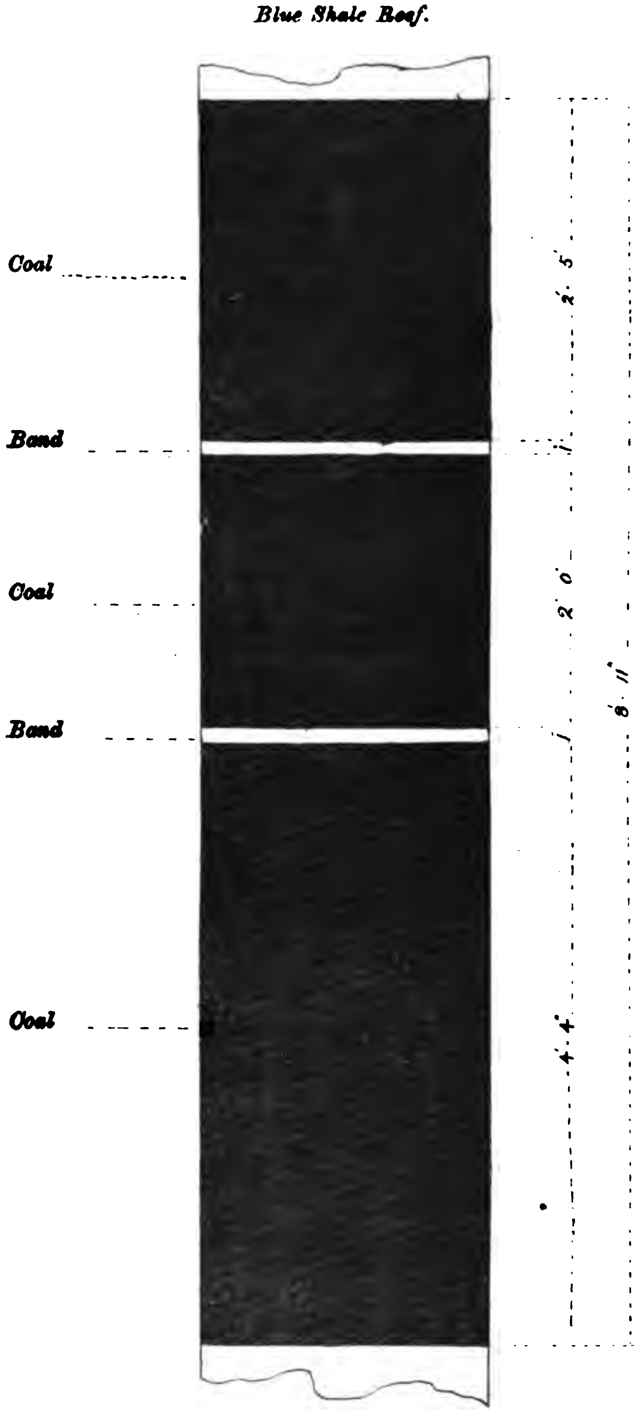
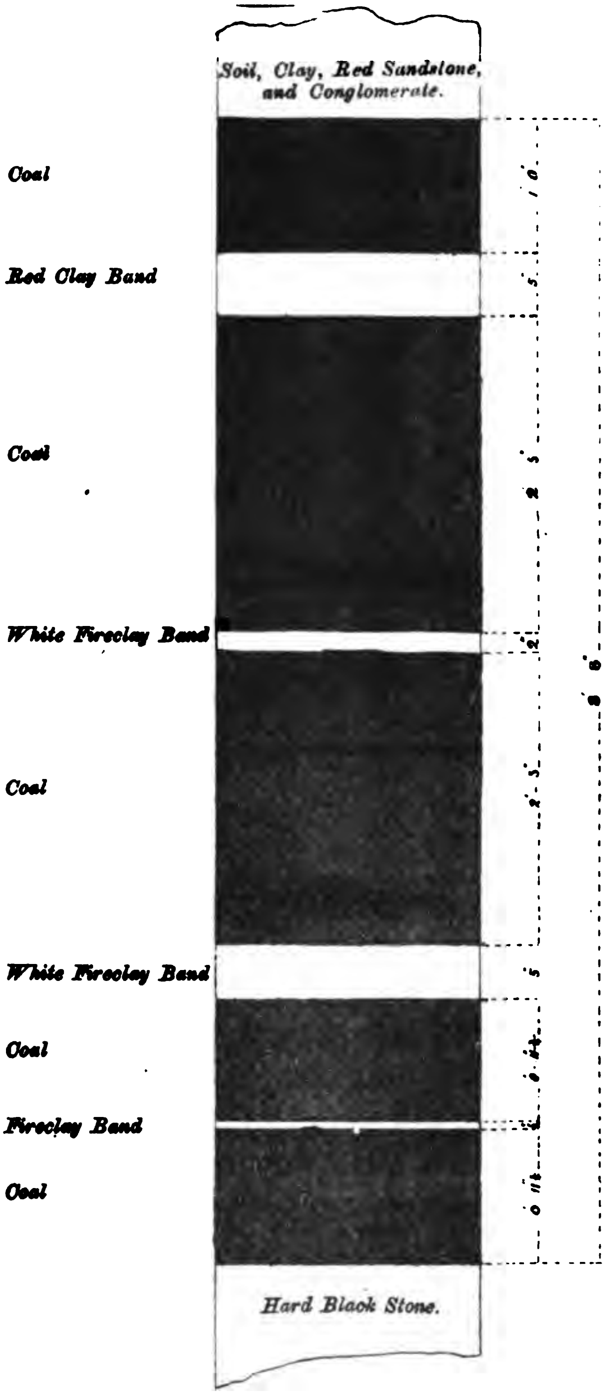


PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE.
SYDNEY, NEW SOUTH WALES.

No 14

WARATAH C.C.

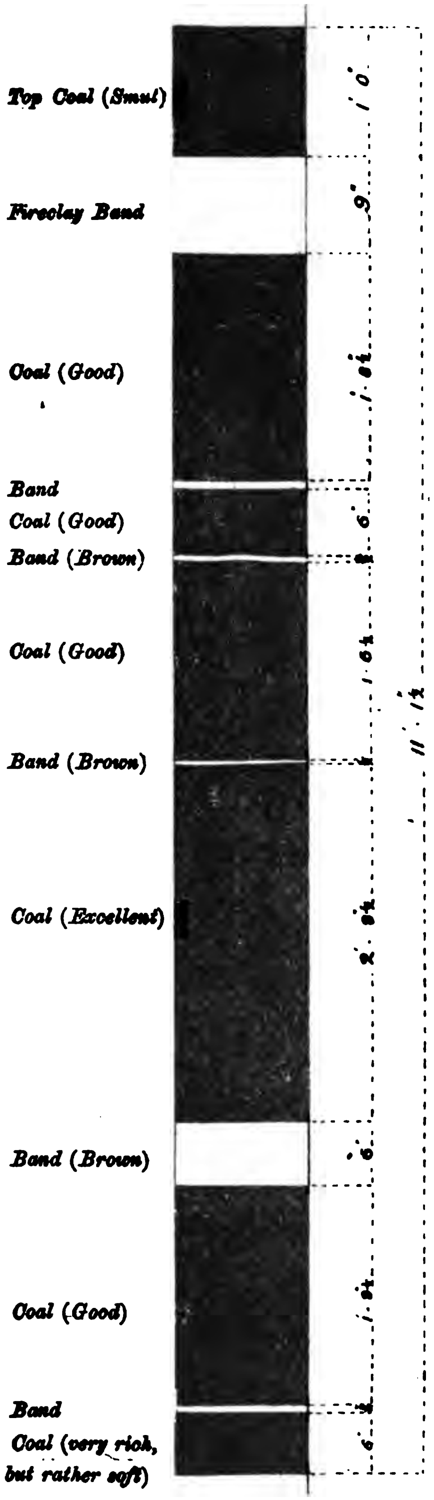
Section of No. 2 Seam found in Yates' No. 1 Shaft in the Company's leased land, Winding Creek, S.W. of Wire Fence Gate.

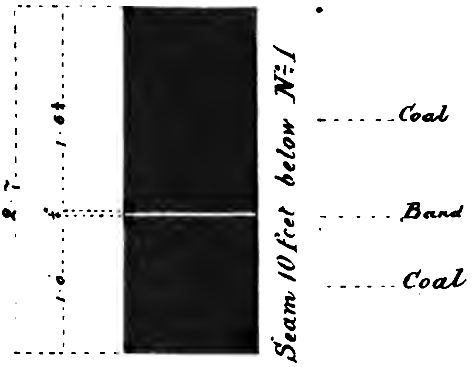


Note.—This seam here is 125 ft. above the top of the Stuart Pit.

Nº 15

WARATAH C.C.





Section of No. 1 Seam in "Bushman's Creek," south-western portion of Waratah Coal Company's Leased Lands (with only 3 feet of cover on the Coal.)

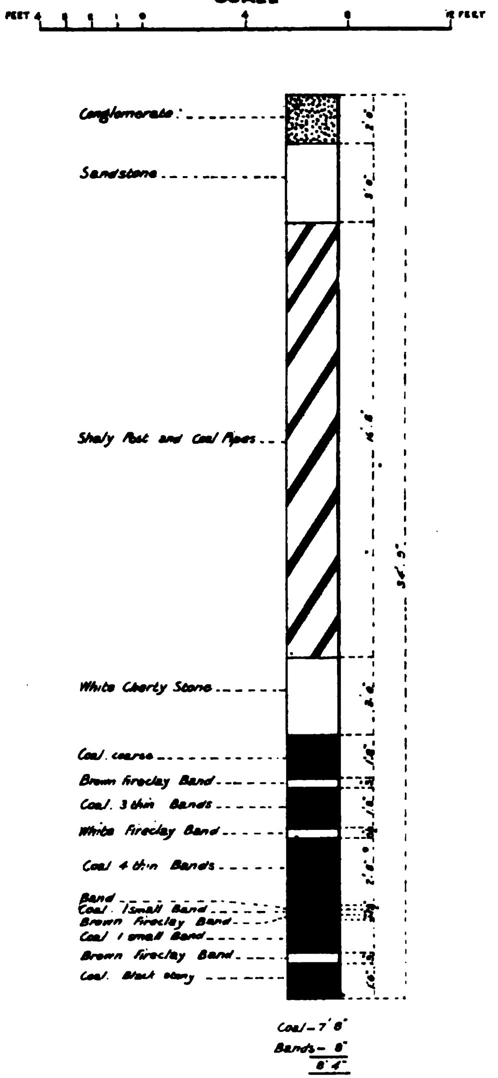
PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

No. 20

WARATAH. C.C.

Section of Ashton's No. 1 Shaft to No. 3 Seam

— Raspberry Creek —



No. 16

Section of Yates No. 2 Shaft sunk through the No. 1 Seam in Bushman's Creek adjoining the No. 1 Shaft

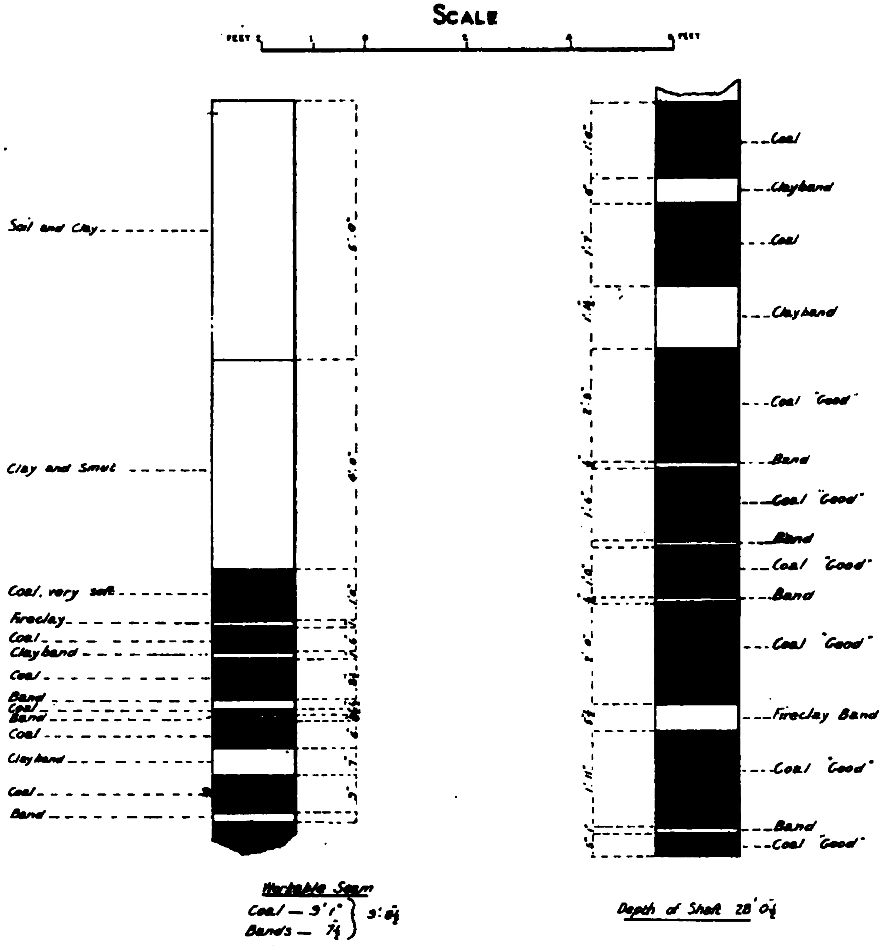
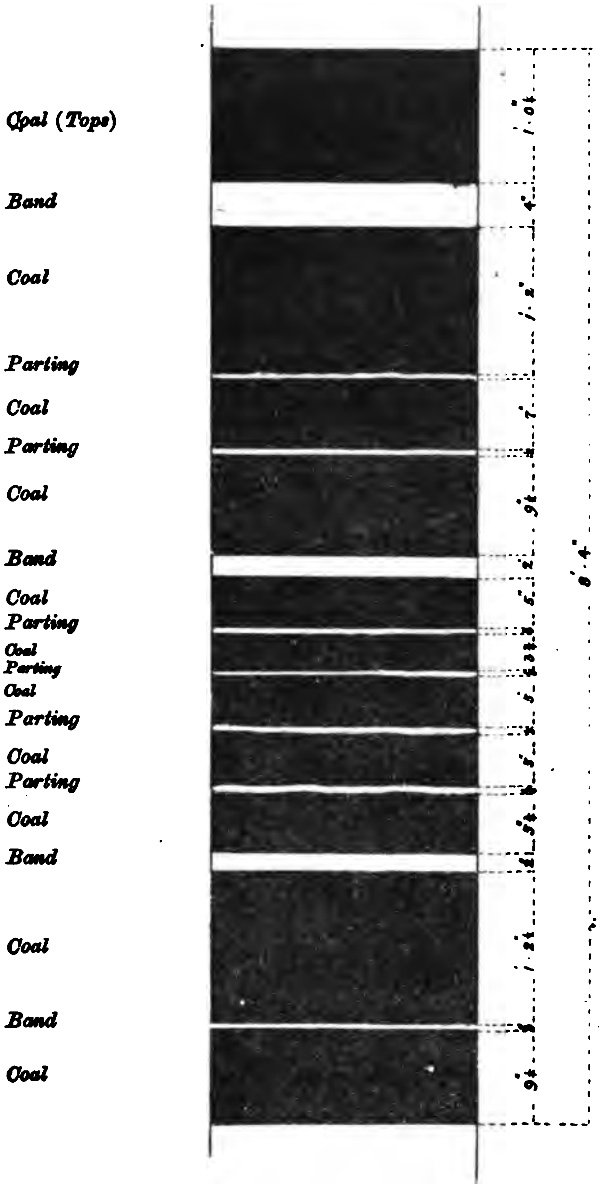


PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

No 17.

True Section of No. 2 Seam, 5½ yards from the bottom of Yates' No. 2 Shaft in Winding Creek, on the S.W. side of Wire Fence Gate.



Note.—Dips due west 3 inches in a yard.

SCALE

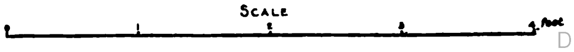
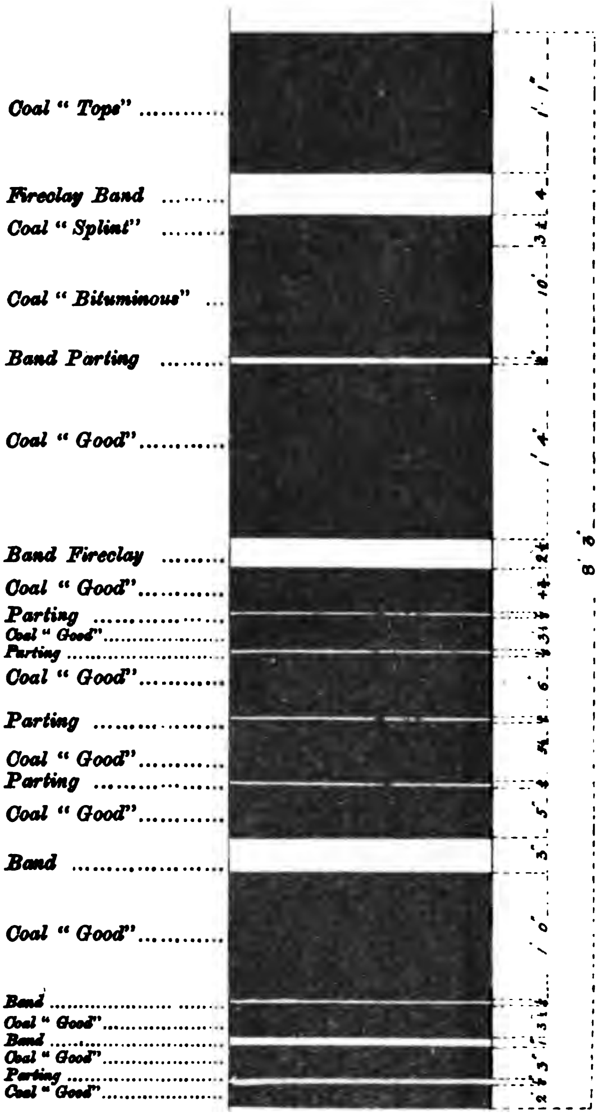


PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES

Nº 18

WARATAH C.C.

True Section of No. 2 Seam 5½ yards from the bottom of Yates No. 3 Shaft in Winding Creek, on west side of Wire-Fence Gate.



Note.—Dips due west 1 in. to a yard.

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE.
SYDNEY, NEW SOUTH WALES.

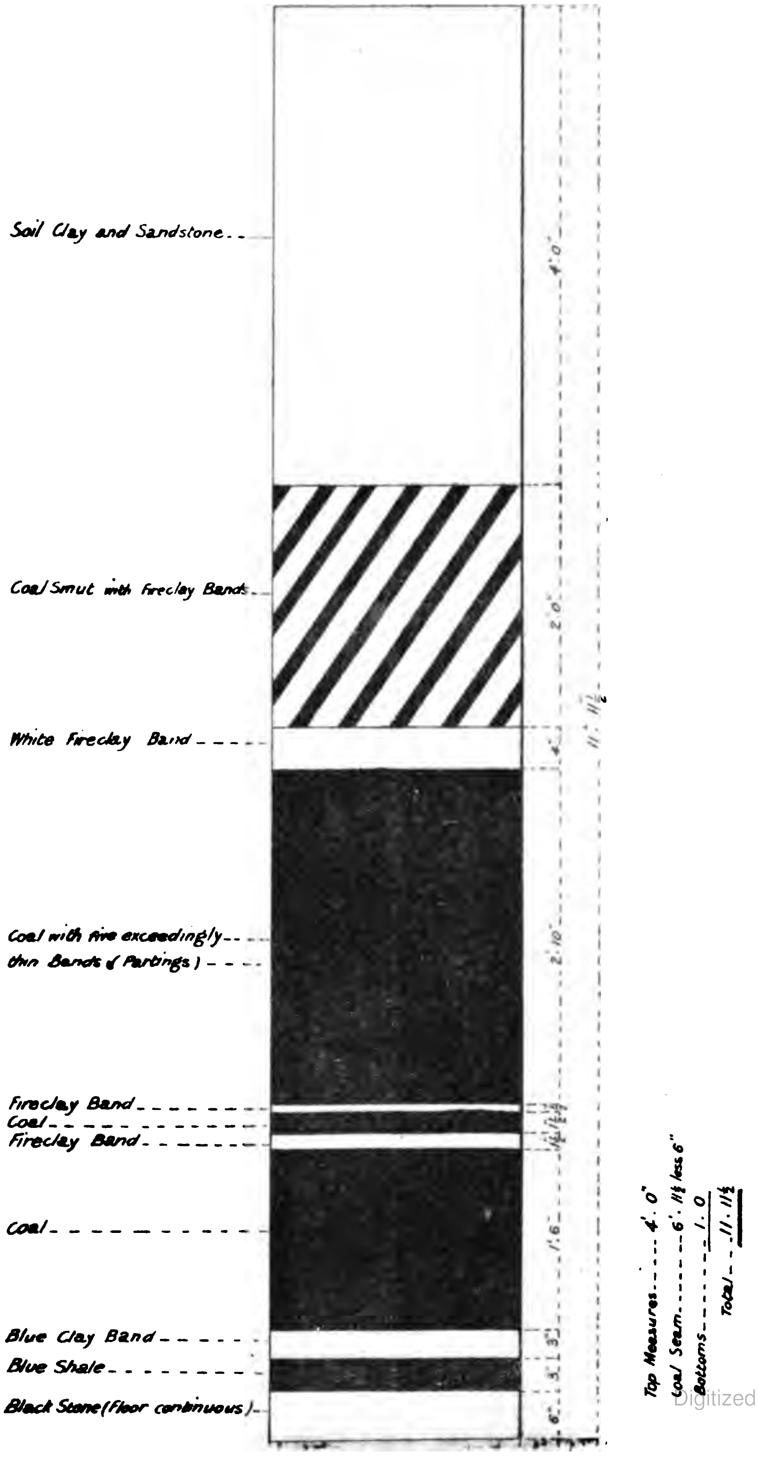
Nº 19

WARATAH. C.C.

Section of Shaft sunk in the Charles Pit Creek on the South in the Company's Land

SCALE

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

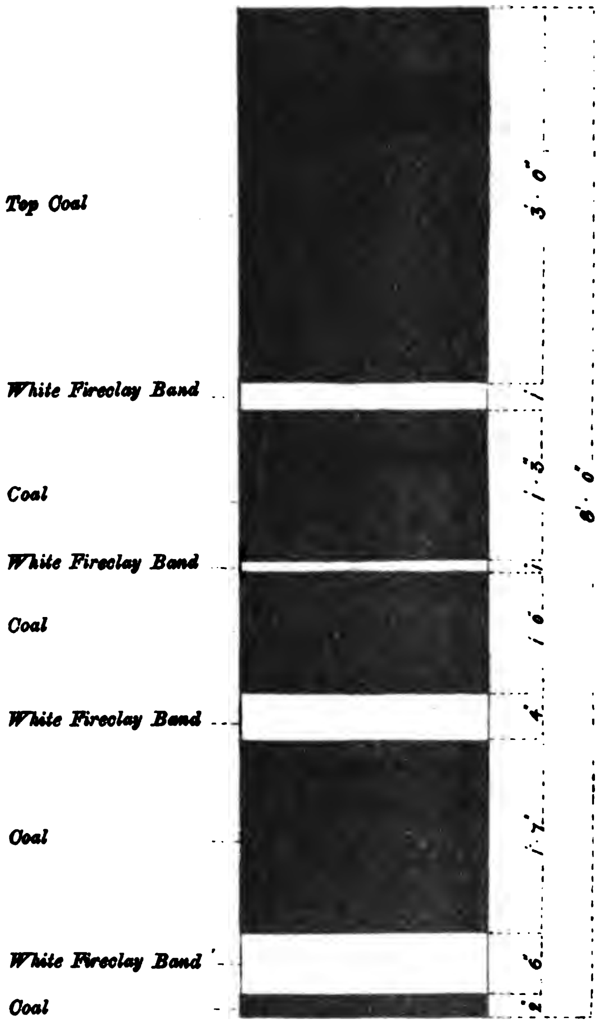


(8a 128 – 79)

Nº 21

WARATAH C.C.

Section of Seam found in Stony Pinch Creek, 140 feet below top of range near the Wire Fence Gate, at N.E. corner of Company's purchased land.



This Seam of Coal is 175 feet above the top of the Stuart Pit.

PHOTO-LITHOGRAPHED AT THE GOVT PRINTING OFFICE.
SYDNEY. NEW SOUTH WALES

No. 22

WARATAH C.C.

Section of Ben's Shaft (No. 1 Seam), west side of Govt. Road, N.W. portion.

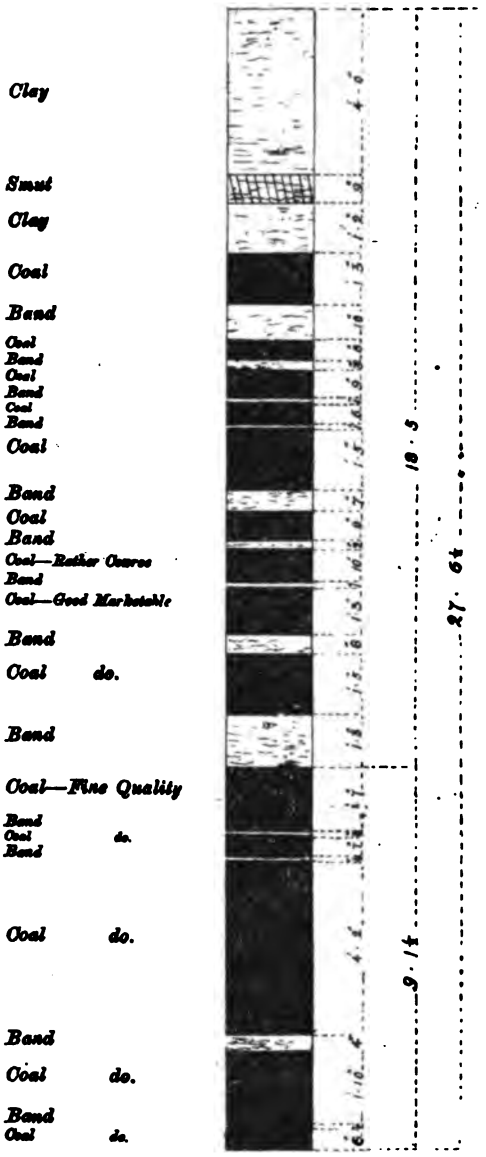
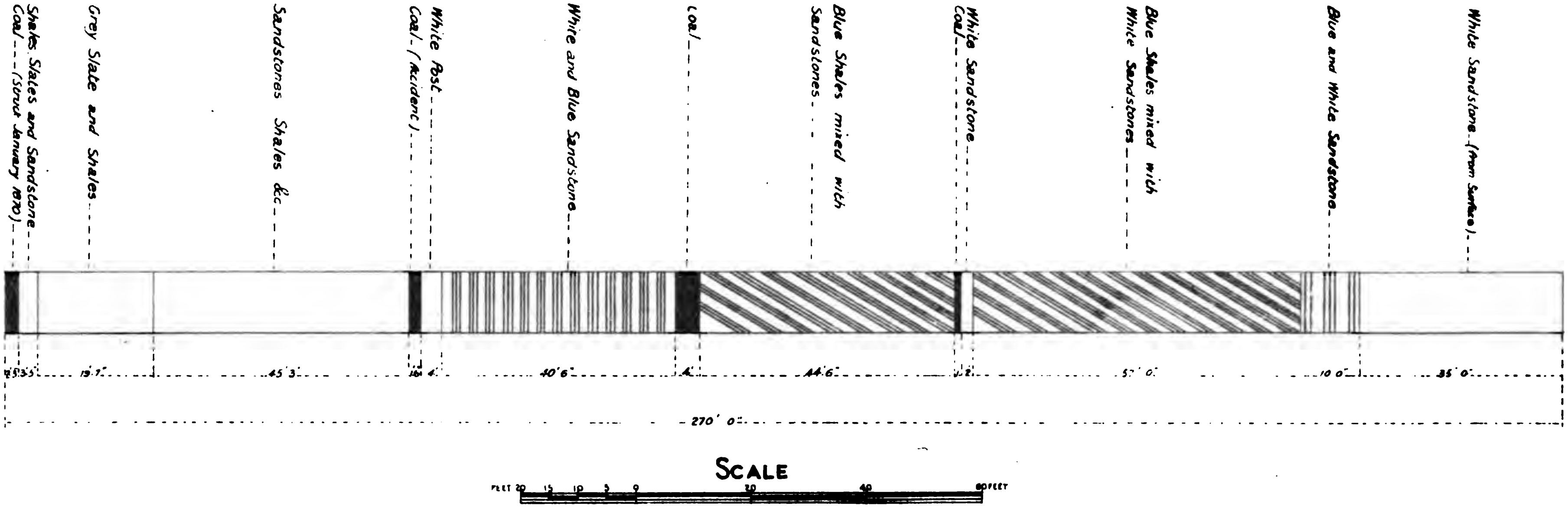


PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE.
SYDNEY, NEW SOUTH WALES.

(8a 128-79)

N°24

LAMBTON. C.



Measures sunk through at the Far South Pit
adjoining Waratah Coal C^os Boundary 1869

W. Steel says go 130 feet further to Main Shaft
J. Groudace ——— 60 feet ———

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

N° 25

LAMBTON C.

Section of Seam taken at the most south-easterly portion of the Company's property.

1873.

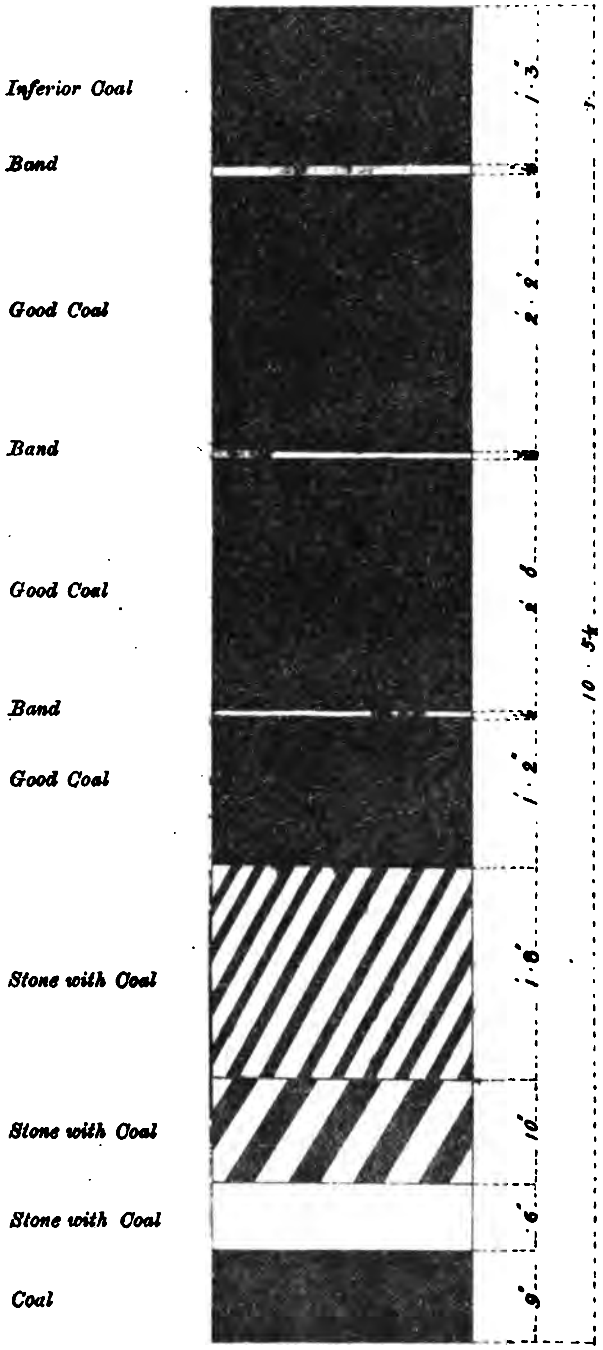
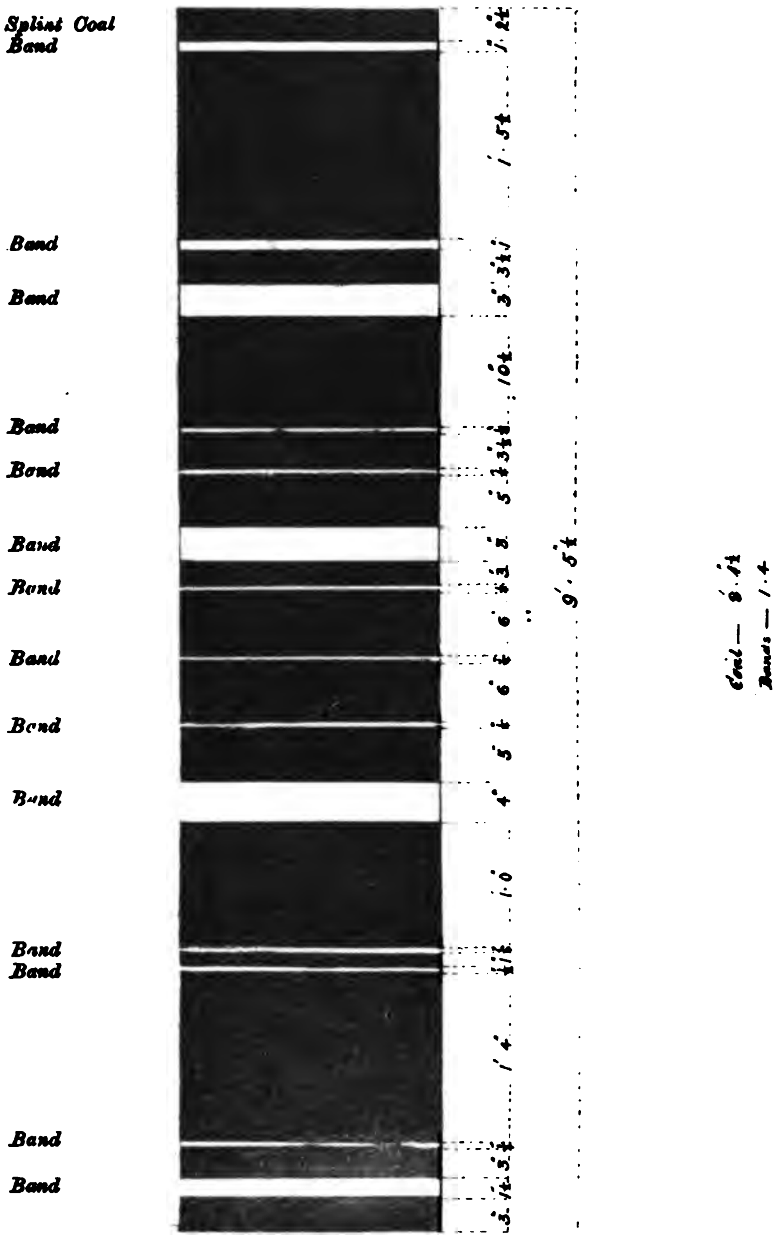


PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE.

Nº 26

Section of No. 3 Seam of Coal, Raspberry Gully, 38 yards and 1 foot S. 35° W. from Ashton's Shaft bottom.

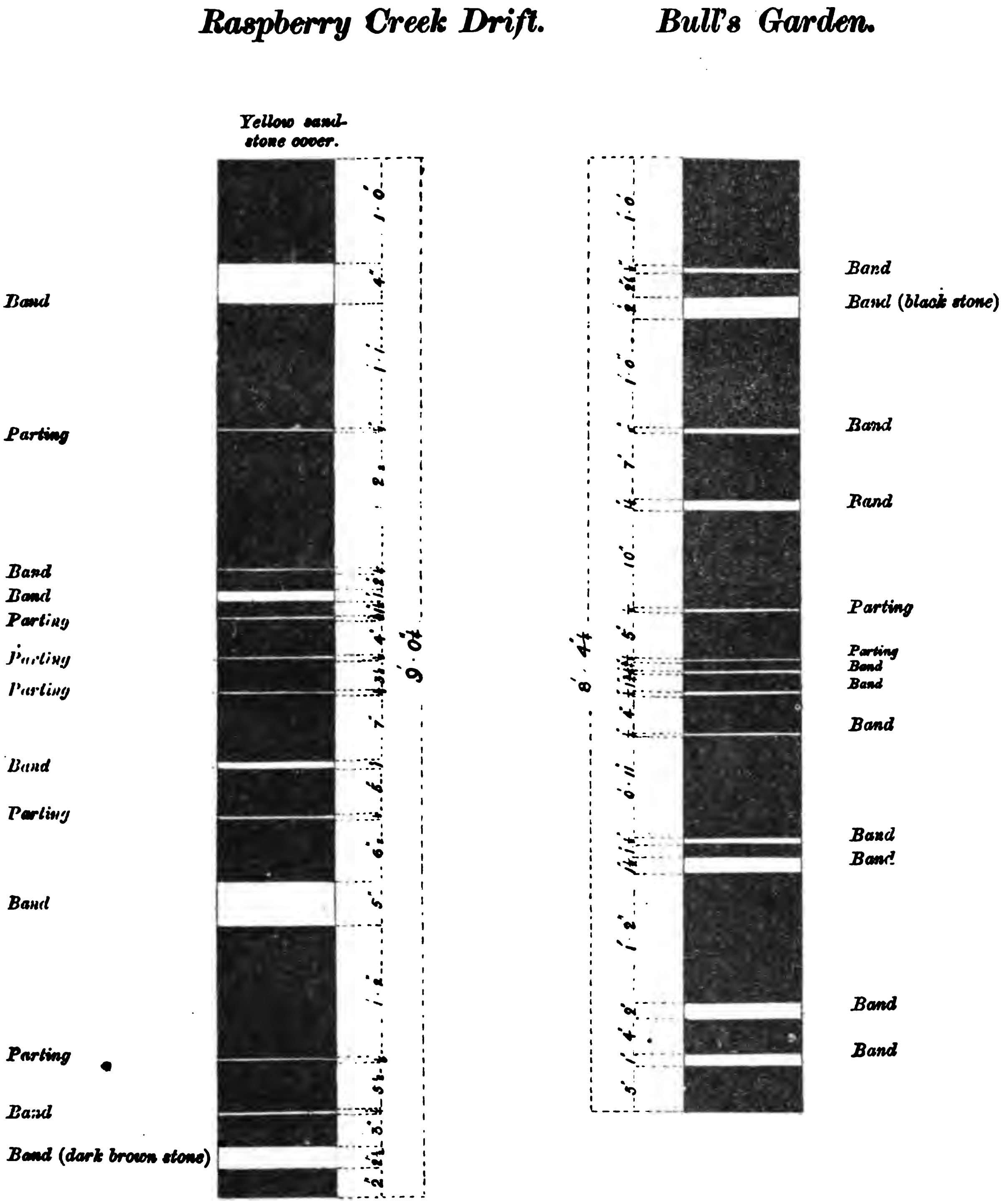


32 yards from Shaft bottom to face of rock.
Dip S. 45° W. Drift S. 35° W.—½ inch per yard.

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

N° 27

Section of No. 2 Seam of Coal (2 miles apart.)



Coal one quality.
White stone bottom.
Dips S. 30° W. ½ inch per yard.

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE.
SYDNEY, NEW SOUTH WALES.

No. 28

NEW LAMBTON.

Section of Coal Seam, present face of Engine Brow.

1873.

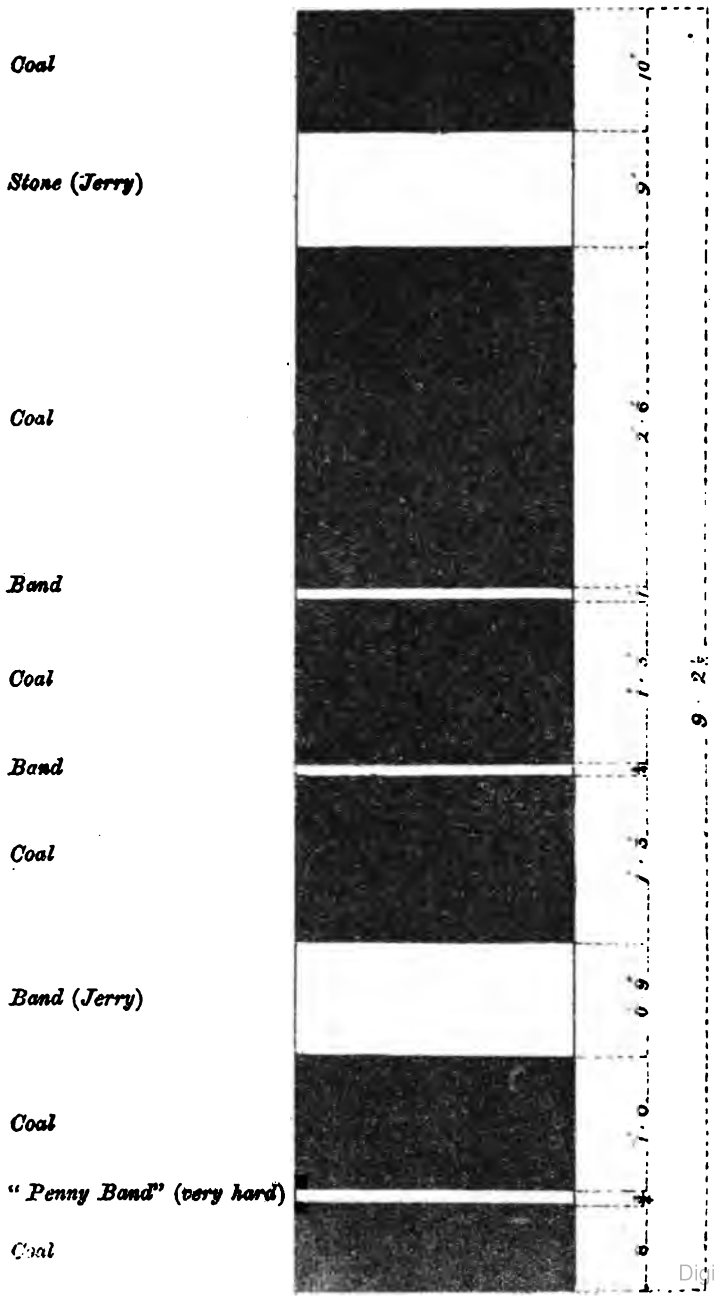
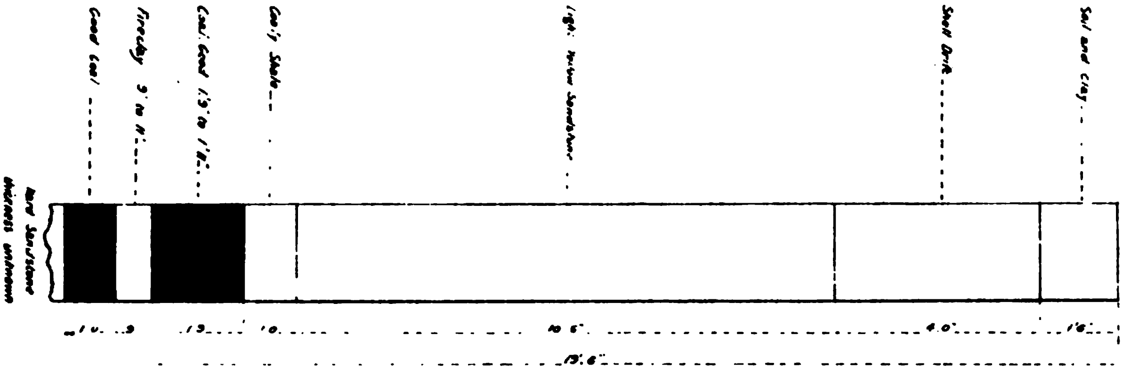


PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE.
SYDNEY, NEW SOUTH WALES.



No. 30

Seam of Coal—North Waratah

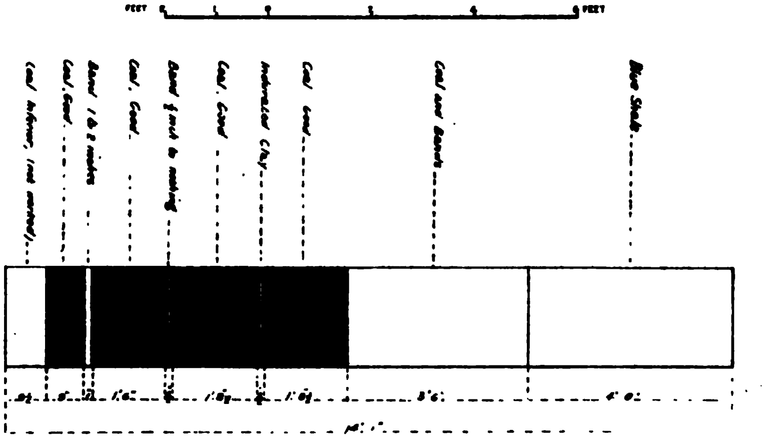
SCALE

FEET 0 1 2 3 4 5 FEET

No. 31

Section of Minmi Coal Seam opened out in 1874.

SCALE



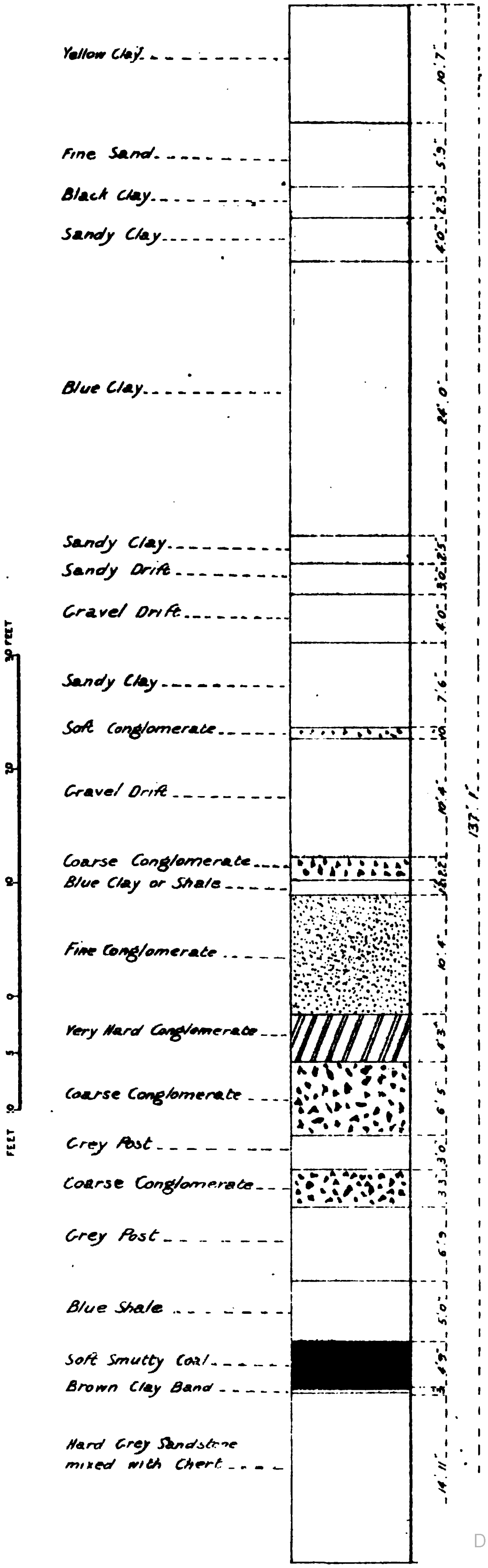
Notes---Seam dips 1 in 24 South 55° West
Bright Bituminous Coal
Uneven. Roof and good Floor
Thickness of workable Seam 5' 9½

PHOTO-LITHOGRAPHED AT THE GOV'T PRINTING OFFICE
SYDNEY NEW SOUTH WALES

Nº 32

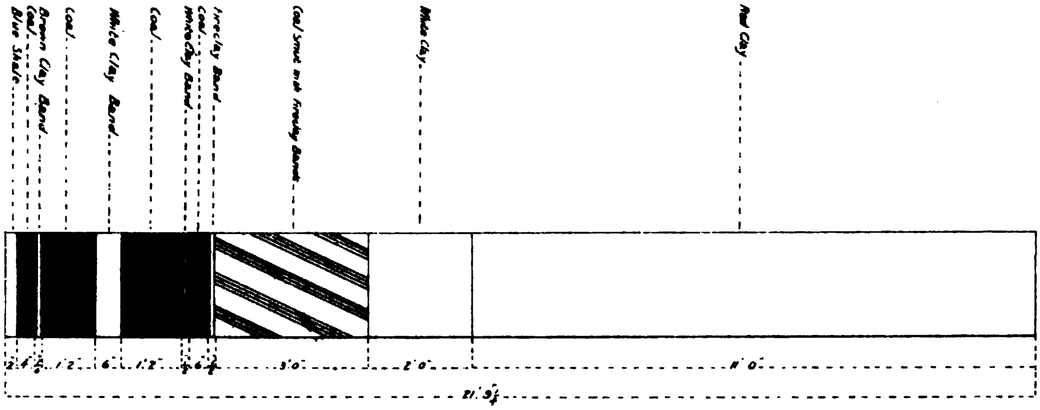
WARATAH. C.C.

Section of Nº4 Borehole in John's Farm N.W from the Stuart Pit.



Coal 117'-2" from Surface

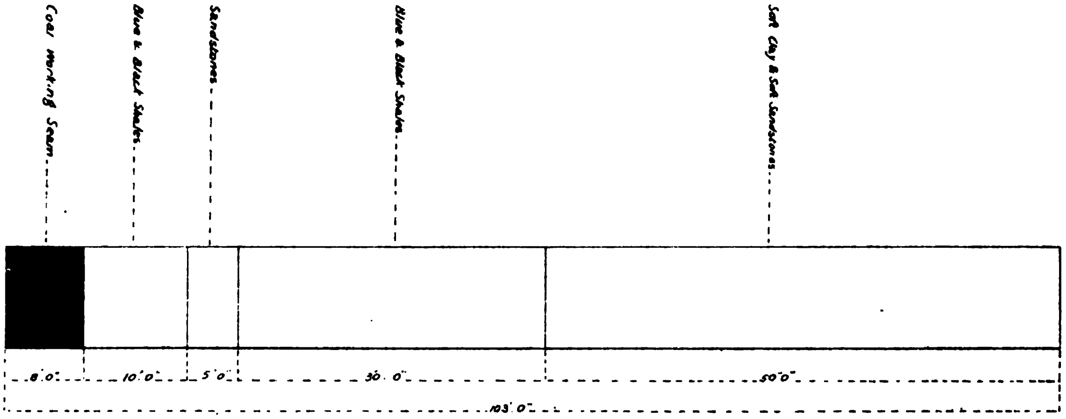
PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.



N° 36

Section of Shaft sunk in Saw-pit Creek west of Tannery
in Waratah Coal Company's Land.

SCALE



N° 33

NEW LAMBTON

Section of Working Shaft

SCALE

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES

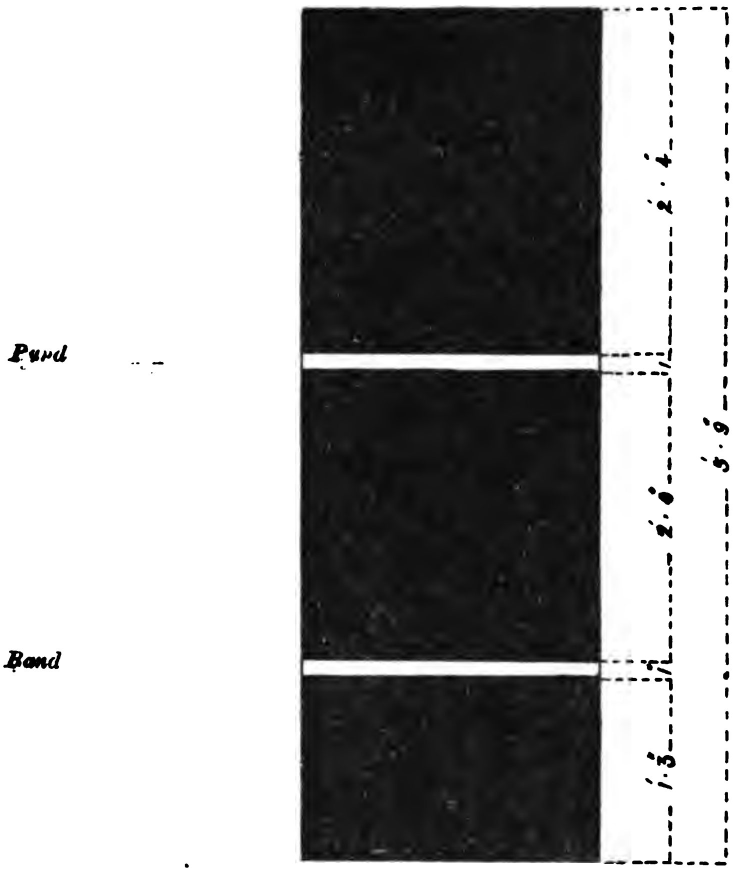
(8a 128-79)

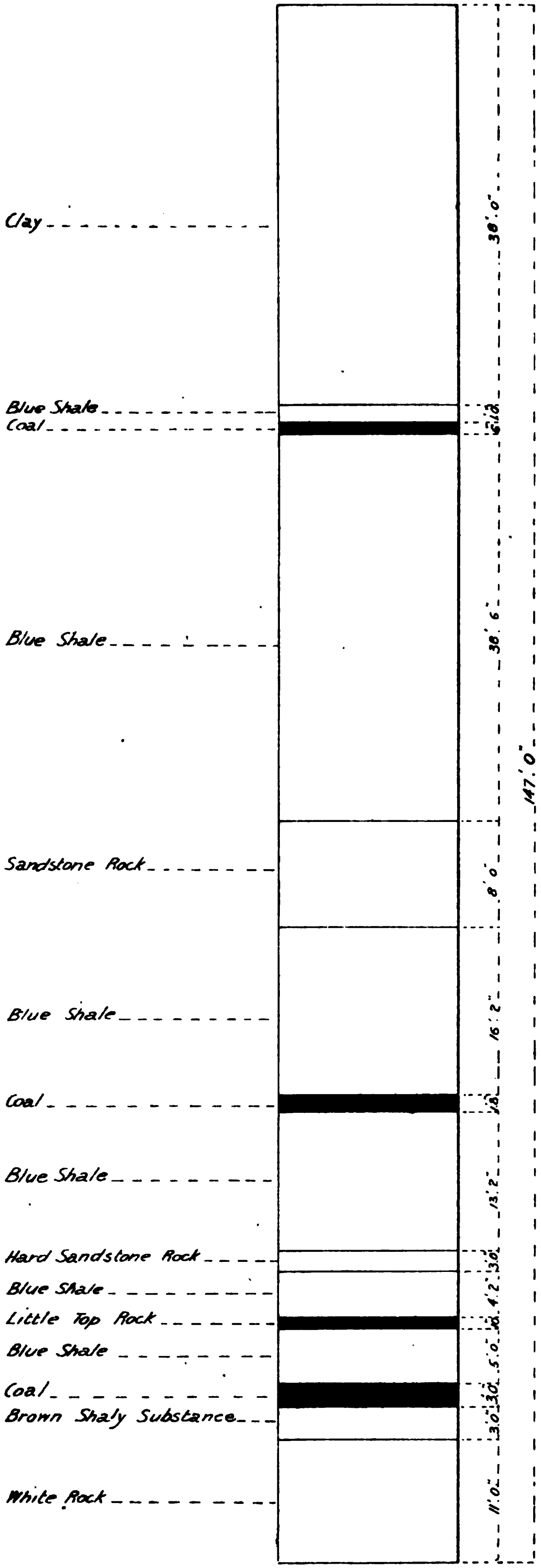
Nº 34

Section of New Lambton Coal Seam.

Down Engine Bank.

1873.





No 35

Section of Strata New Pit New Lambton Colliery.

November 23rd 1875.

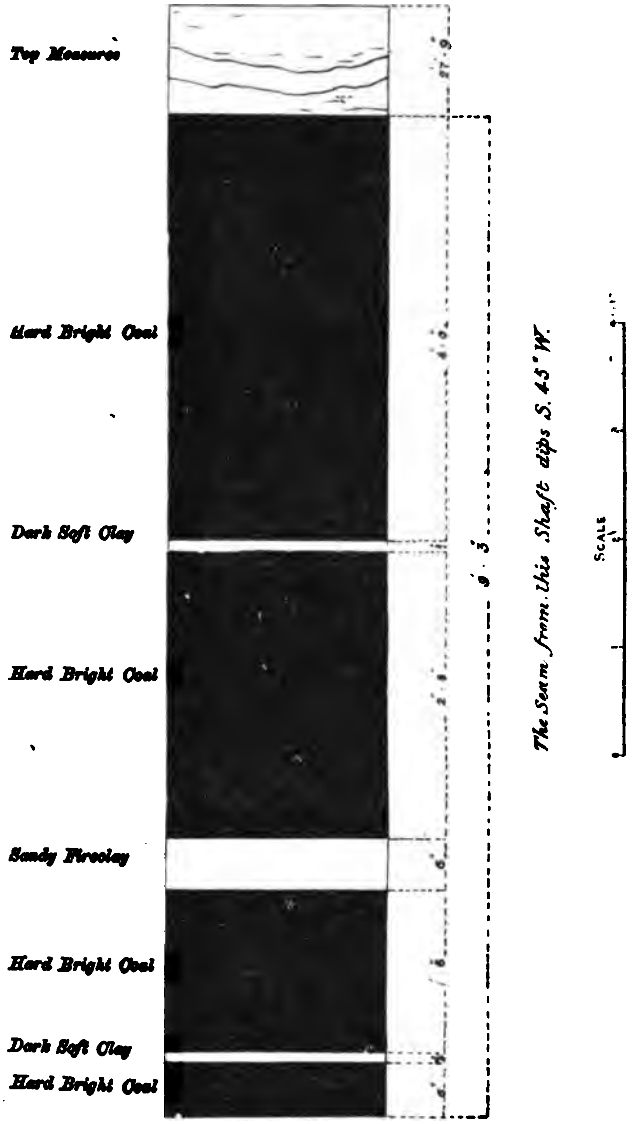
SCALE

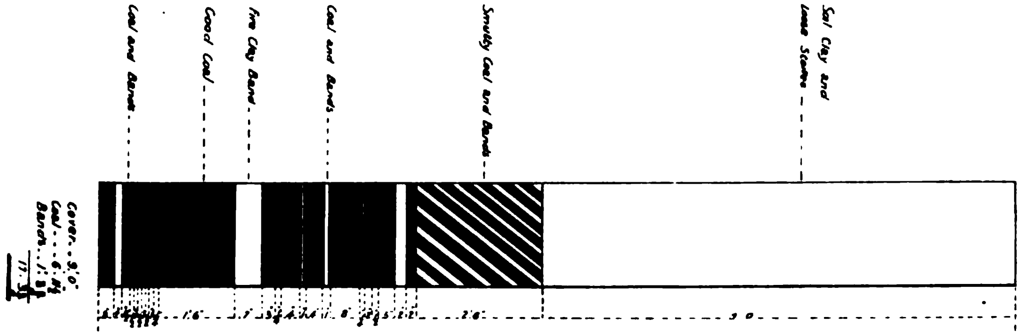
PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

N°37

WARATAH C.C.

Peatties' Shaft, Bushman's Creek,
No. 1 Seam.





N° 38

WARATAH. C.C.

Section of Seam found in Oakey Creek below the Road
—— on top of Range N° 2 Seam. ——

SCALE

FEET 2 1 0 2 4 6 FEET

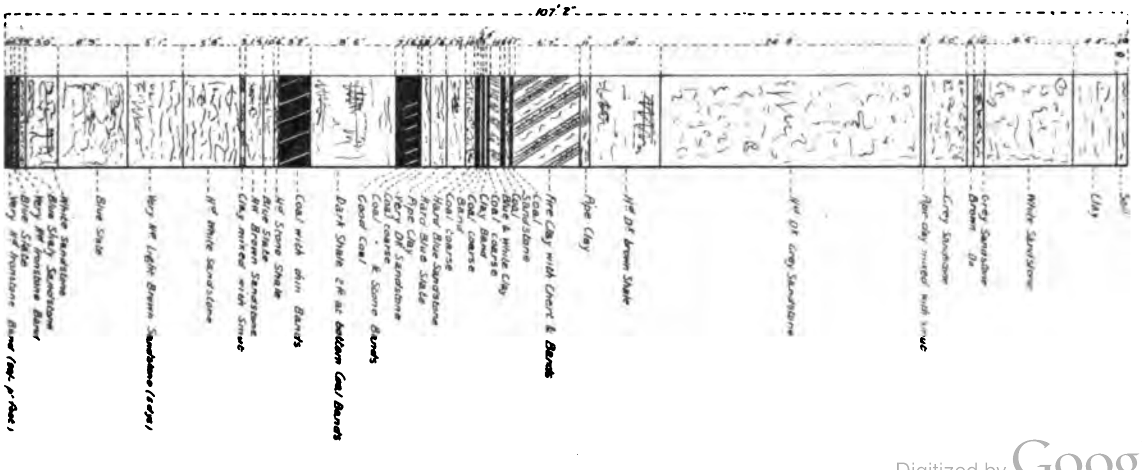
PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

N° 54

Section of N° 2 Borehole Teralba for Carrett & C°

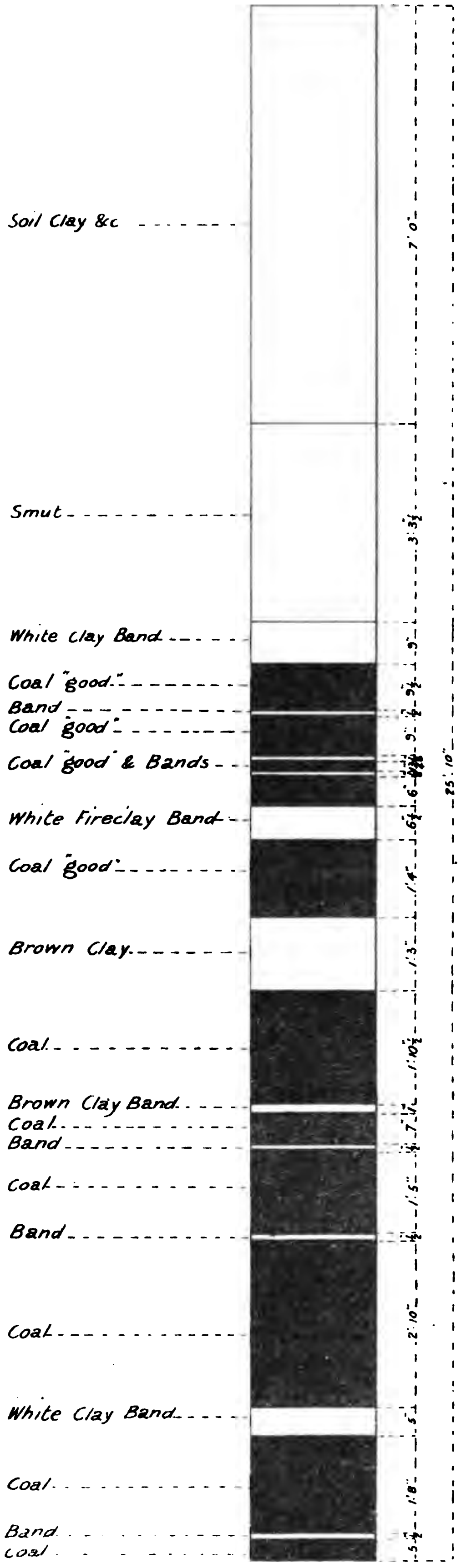
SCALE

FEET 10 5 0 10 20 30 FEET



No 39

Section of Shaft to No1 Seam — Christmas Creek.



Coal 4' 1¼ Top Seam
" 9' 5" Best Seam

This Seam rises here N 40° E and about 1 inch to the yard.

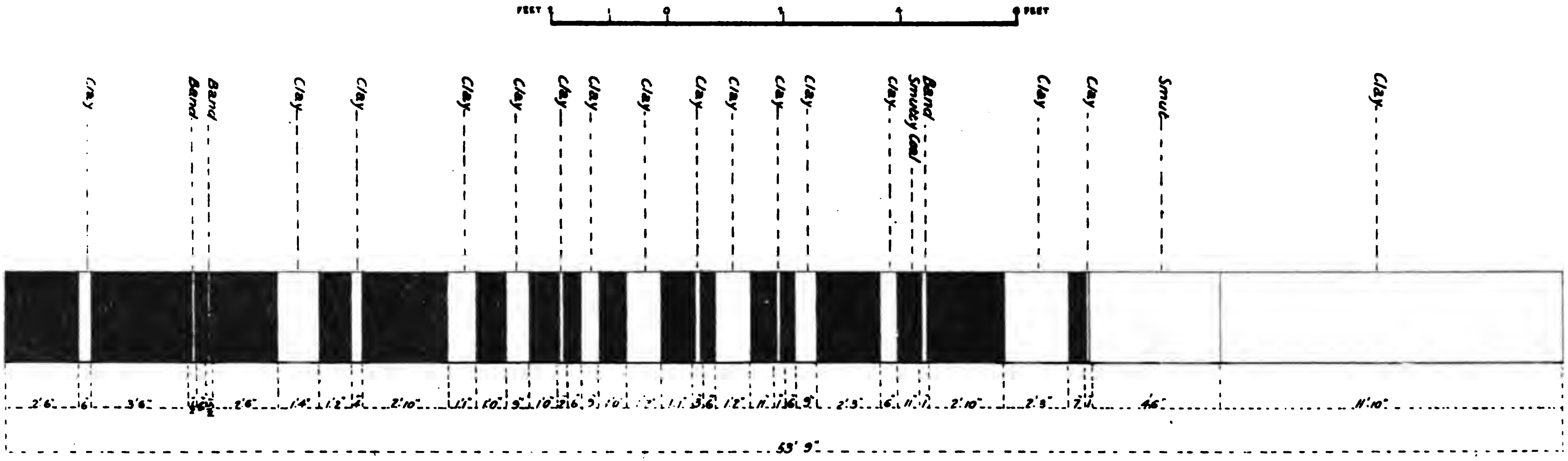
SCALE

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

Nº 40

WARATAH. C.C.

SCALE



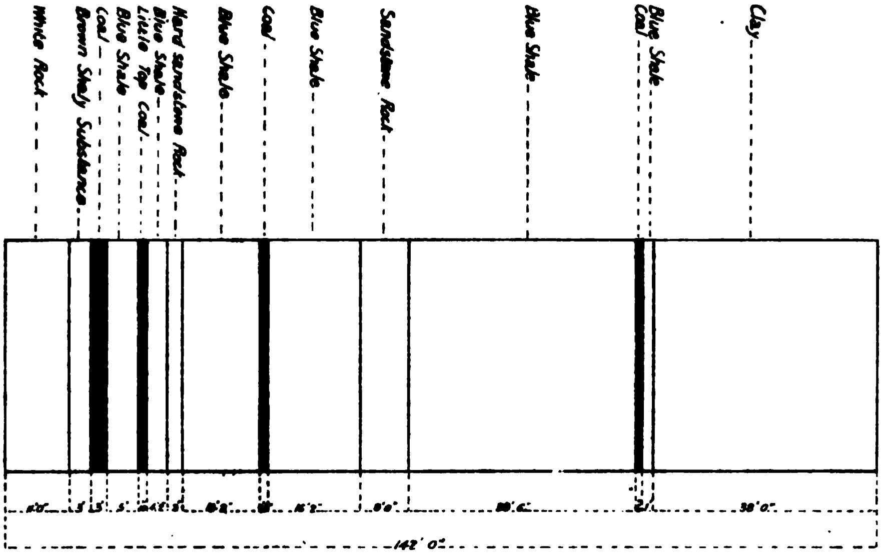
Section of Ashtons Nº3 Borehole about 300 yards South of the Wire Fence Gate in W.C. Cᵒˢ Leased Land. Bored through the Nº1 or Winding Creek Seam.

Nº1 Borehole put down on North side of Wire Fence by Ashton. 17ft Clay - 1ft Conglomerate

- 2 - - - - - - - - - South - - - - - - - - - - - - - between the fence & Nº3 hole

23ft Clay - 1ft Conglomerate ——

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

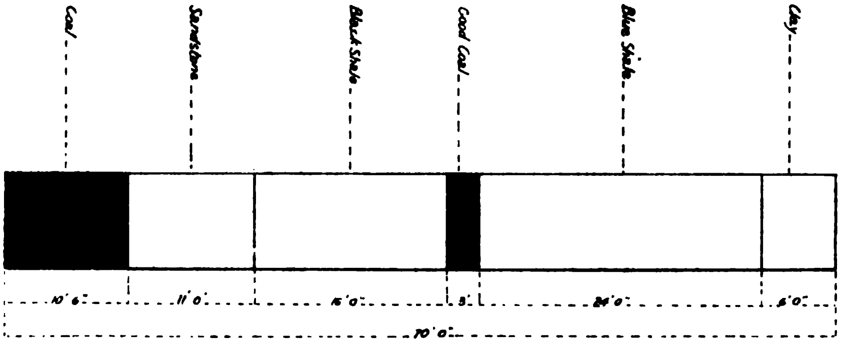


Nº 43

NEW LAMBTON.

Section of Strata of New Pit — November 23rd 1873.

SCALE



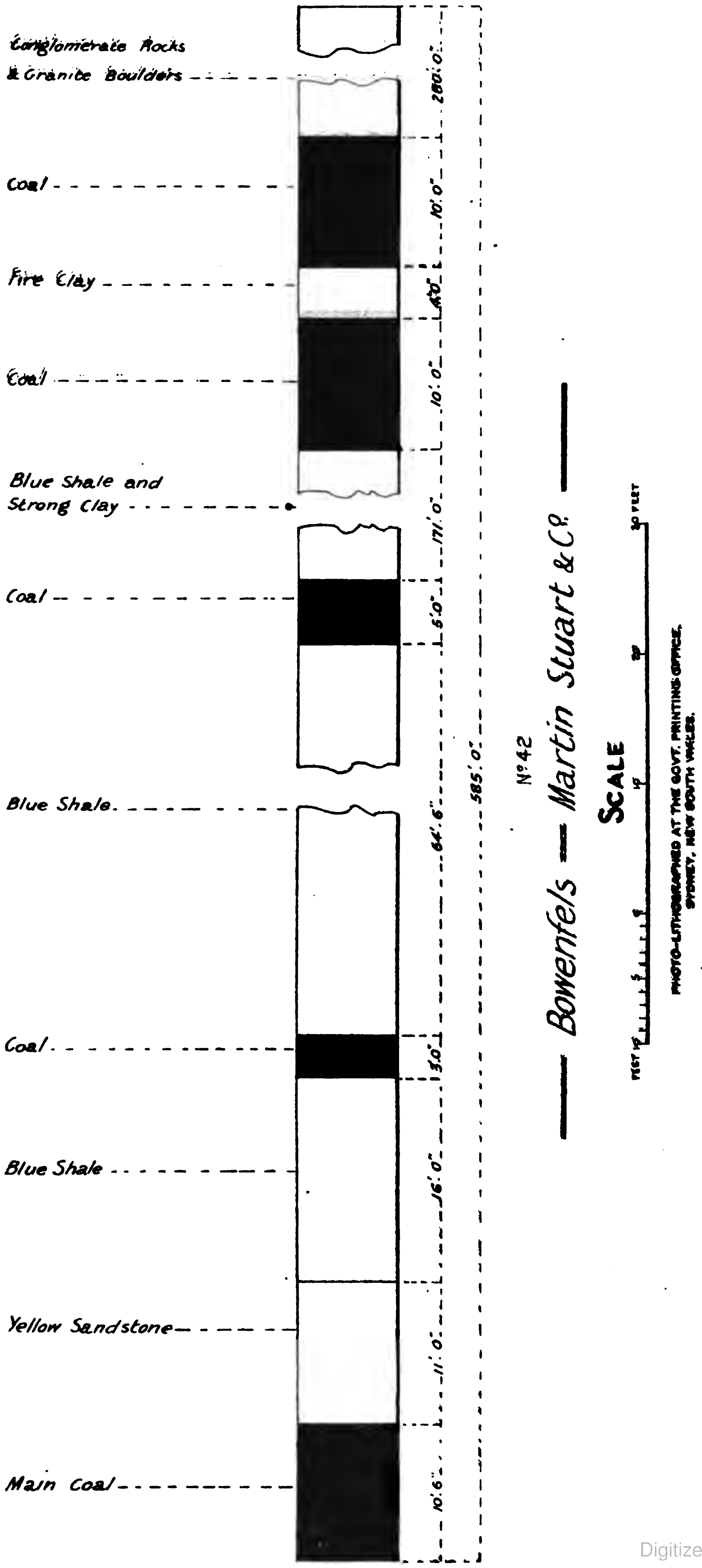
Nº 41

BOWENFELS.

Small Shaft sunk through to Main Coal about 30 yards to the N.W. of Tunnel —— Bowenfels Colliery.

SCALE

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

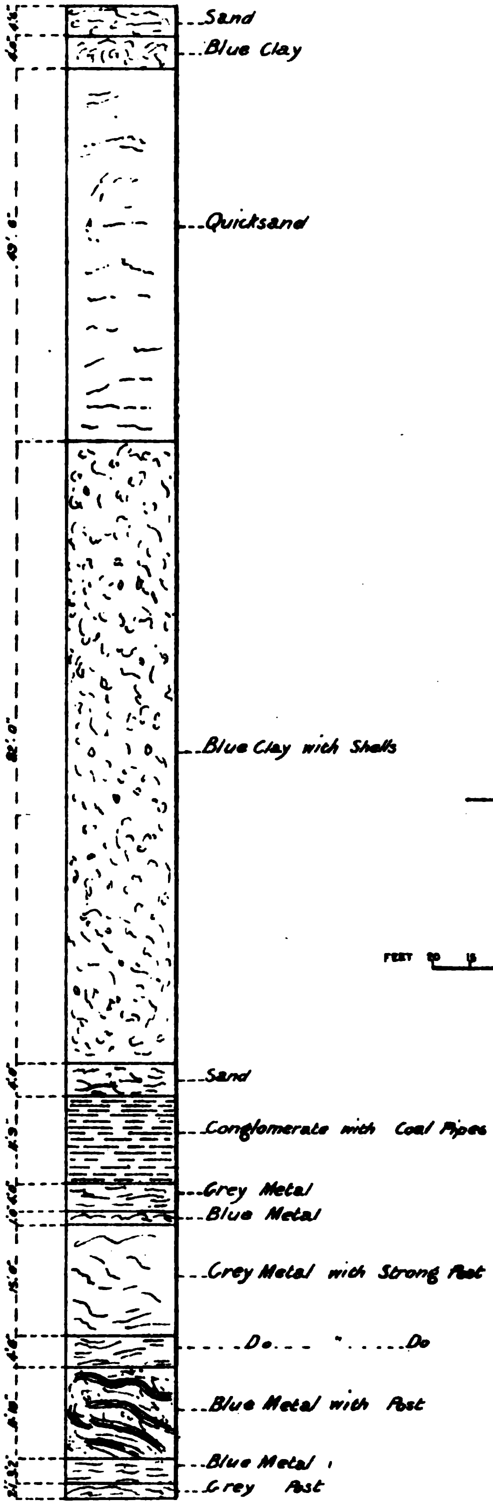


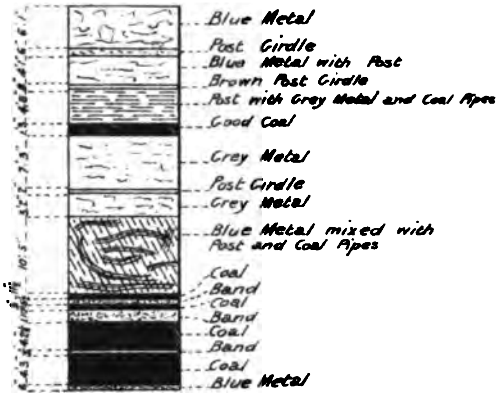
No 42

Bowenfels — Martin Stuart & Co.

SCALE

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.





Total depth of Bore 248 ft 2 in

No. 45

— Stockton – North Shore —

Section of No. 1 Borehole

SCALE

FEET 20 15 10 5 0 20 40 60 FEET

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

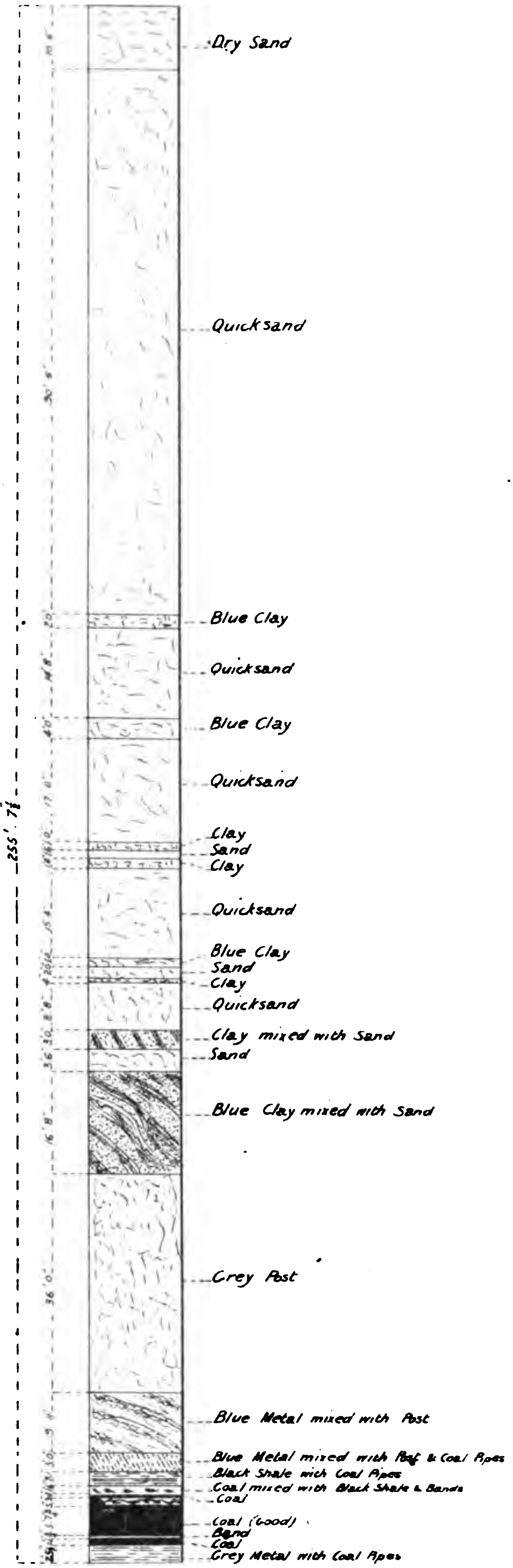
No 46

Stockton — North Shore — Section of $\frac{5}{2}$ Borehole

SCALE

FEET 20 15 10 5 0 10 20 30 40 50 FEET

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.


255' 7½"
Dry Sand
Quicksand
Blue Clay
Quicksand
Blue Clay
Quicksand
Clay
Sand
Clay
Quicksand
Blue Clay
Sand
Clay
Quicksand
Clay mixed with Sand
Sand
Blue Clay mixed with Sand
Grey Post
Blue Metal mixed with Post
Blue Metal mixed with Post & Coal Pipes
Black Shale with Coal Pipes
Coal mixed with Black Shale & Bands
Coal
Coal (Good)
Band
Coal
Grey Metal with Coal Pipes

No. 47

WARATAH. C.C

Section of Measures in Charles Pit

— *1873* —

SCALE

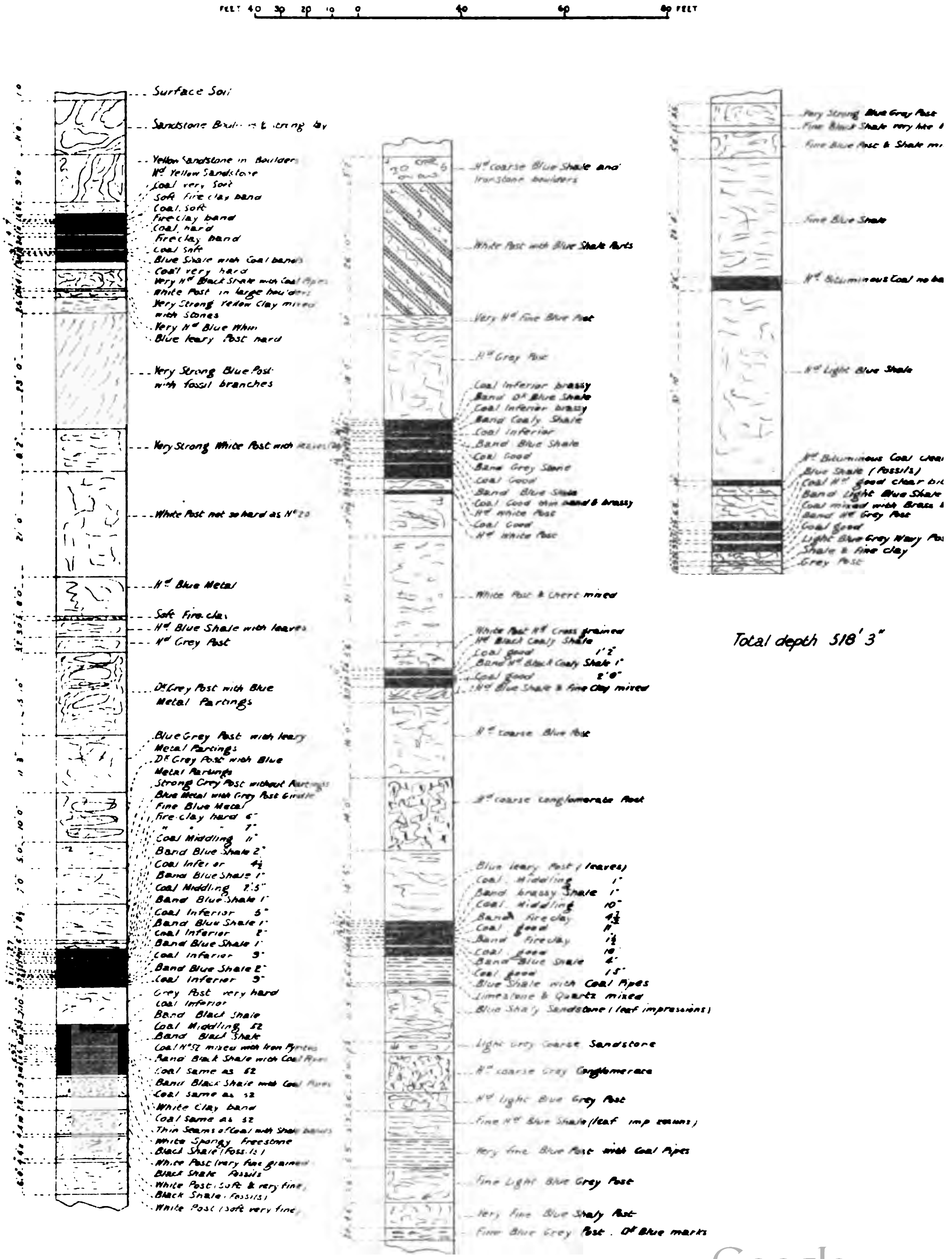


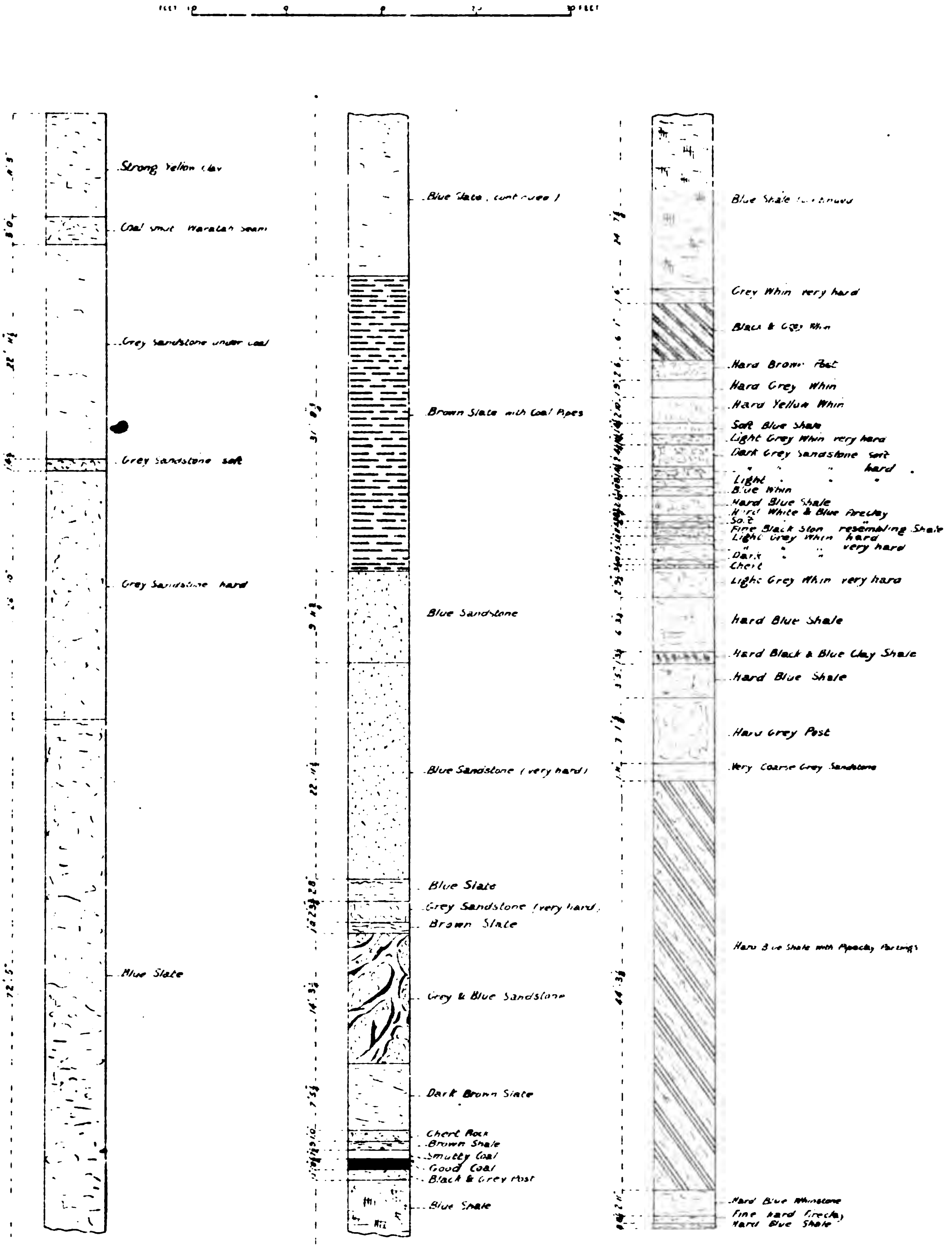
PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE.
SYDNEY, NEW SOUTH WALES.

Nº 48

WARATAH C.C.

Section of Bore at Old Tunnels

SCALE



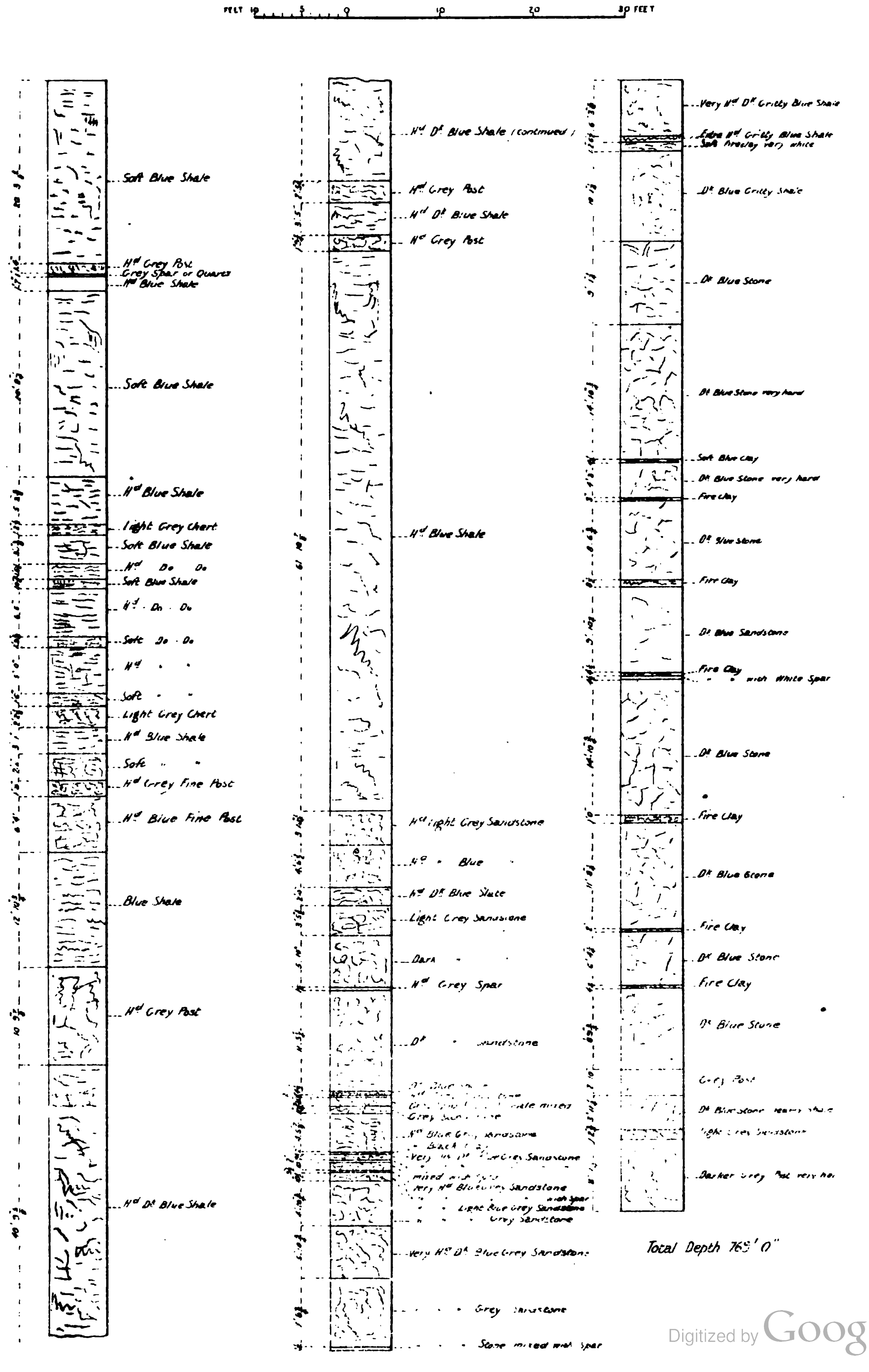
8 a 128-19

No 49

WARATAH C.C.

Bore at Old Tunnels (continued)

SCALE



Total Depth 765' 0"

N° 50

Section of Jarley Borehole—Mangrove Creek

—Hawkesbury—

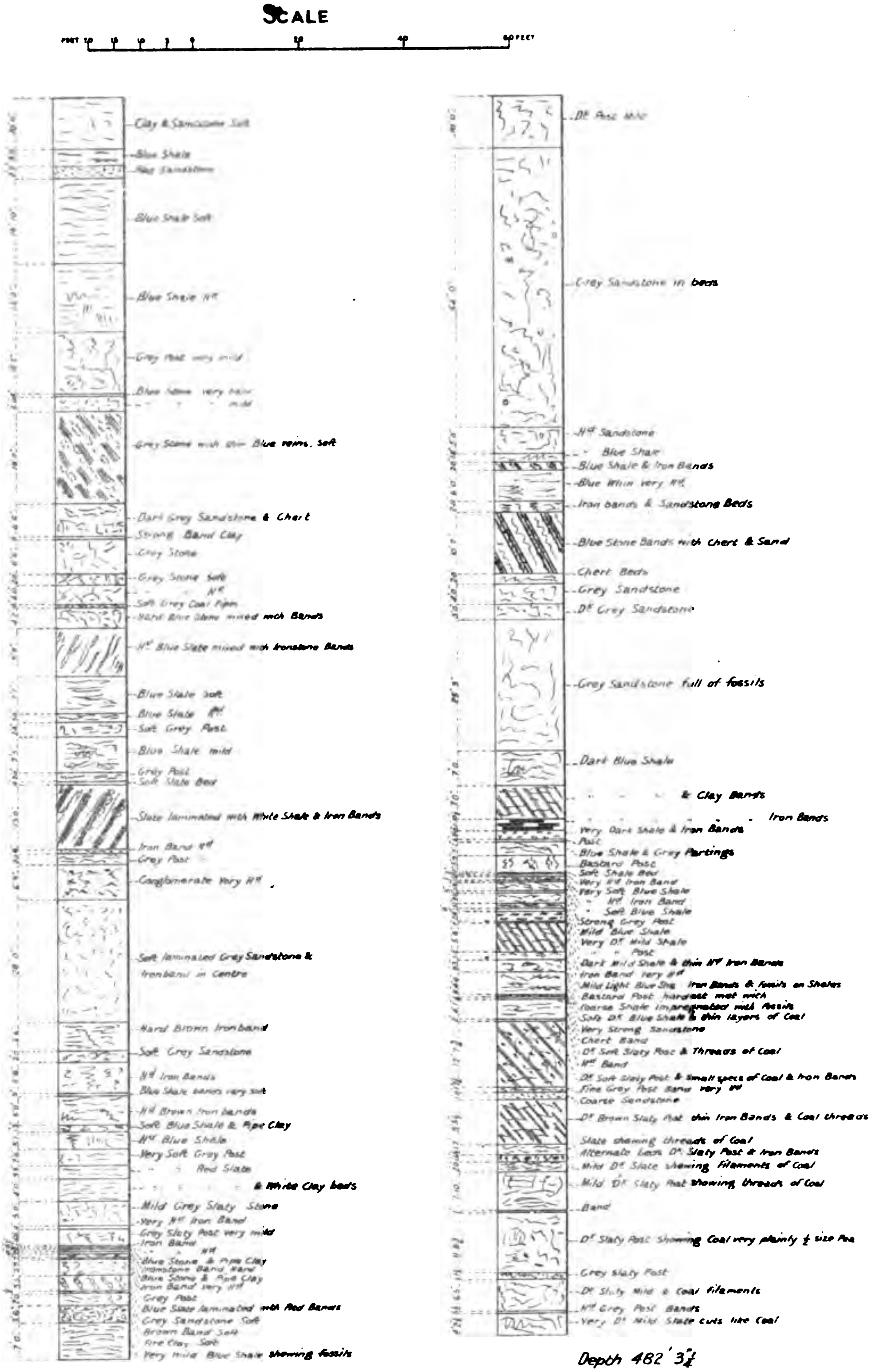
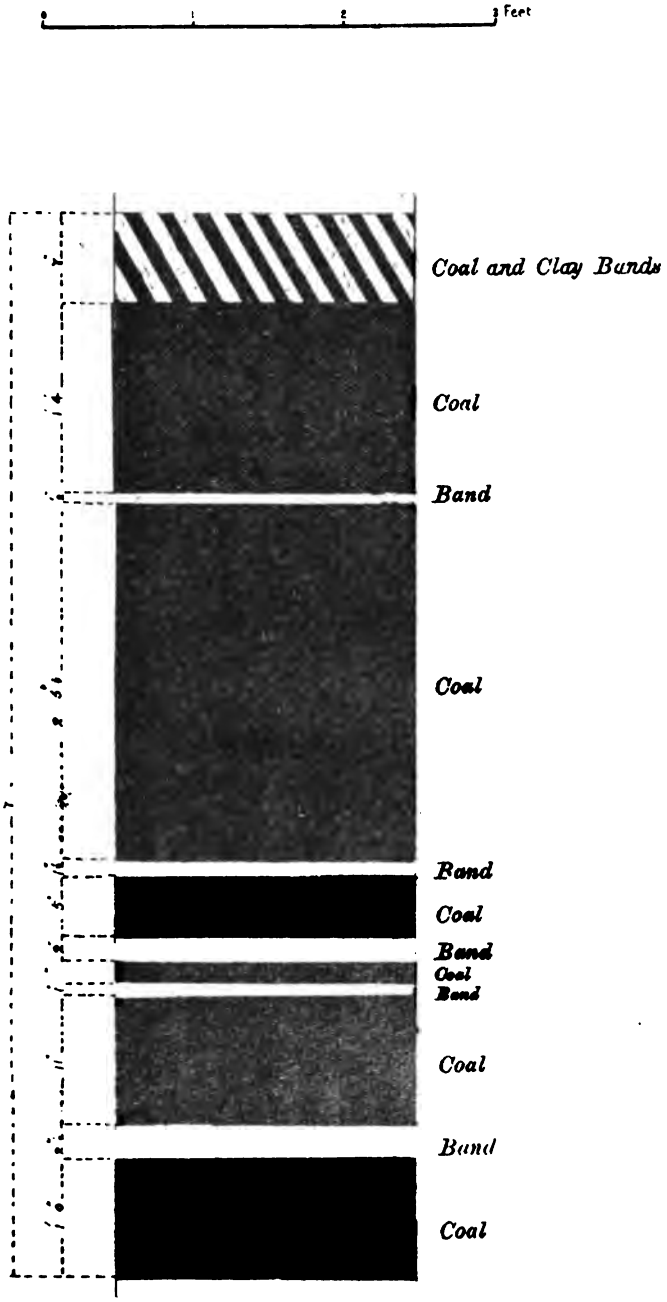

SCALE
FEET 20 15 10 5 0 20 40 60 FEET
Clay & Sandstone Soft
Blue Shale
Red Sandstone
Blue Shale Soft
Blue Shale Hd
Grey Post very mild
Blue Stone very hard
" " " mild
Grey Stone with thin Blue veins, soft
Dark Grey Sandstone & Chert
Strong Band Clay
Grey Stone
Grey Stone soft
" " Hd
Soft Grey Coal Pipes
Hard Blue Stone mixed with Bands
Hd Blue Slate mixed with Ironstone Bands
Blue Slate soft
Blue Slate Hd
Soft Grey Post
Blue Shale mild
Grey Post
Soft Slate Bed
Slate laminated with White Shale & Iron Bands
Iron Band Hd
Grey Post
Conglomerate Very Hd
Soft laminated Grey Sandstone & Ironband in Centre
Hard Brown Ironband
Soft Grey Sandstone
Hd Iron Bands
Blue Shale bands very soft
Hd Brown Iron bands
Soft Blue Shale & Pipe Clay
Hd Blue Shale
Very Soft Grey Post
" " Red Slate
" " " " & White Clay beds
Mild Grey Slaty Stone
Very Hd Iron Band
Grey Slaty Post very mild
Iron Band
" " Hd
Blue Stone & Pipe Clay
Ironstone Band Hard
Blue Stone & Pipe Clay
Iron Band very Hd
Grey Post
Blue Slate laminated with Red Bands
Grey Sandstone Soft
Brown Band Soft
Fire Clay Soft
Very mild Blue Shale showing fossils
Dk Post Mild
Grey Sandstone in beds
Hd Sandstone
" Blue Shale
Blue Shale & Iron Bands
Blue Whin very Hd
Iron bands & Sandstone Beds
Blue Stone Bands with Chert & Sand
Chert Beds
Grey Sandstone
Dk Grey Sandstone
Grey Sandstone full of fossils
Dark Blue Shale
" " " & Clay Bands
" " " " Iron Bands
Very Dark Shale & Iron Bands
Post
Blue Shale & Grey Partings
Bastard Post
Soft Shale Bed
Very Hd Iron Band
Very Soft Blue Shale
" Hd Iron Band
" Soft Blue Shale
Strong Grey Post
Mild Blue Shale
Very Dk Mild Shale
" " Post
Dark Mild Shale & thin Hd Iron Bands
Iron Band very Hd
Mild Light Blue Sha Iron Bands & fossils on Shales
Bastard Post hardest met with
Coarse Shale impregnated with fossils
Soft Dk Blue Shale & thin layers of Coal
Very Strong Sandstone
Chert Band
Dk Soft Slaty Post & Threads of Coal
Hd Band
Dk Soft Slaty Post & small specs of Coal & Iron Bands
Fine Grey Post Band very Hd
Coarse Sandstone
Dk Brown Slaty Post thin Iron Bands & Coal threads
Slate showing threads of Coal
Alternate beds Dk Slaty Post & Iron Bands
Mild Dk Slate showing filaments of Coal
Mild Dk Slaty Post showing threads of Coal
Band
Dk Slaty Post showing Coal very plainly ¼ size Pea
Grey Slaty Post
Dk Slaty Mild & Coal filaments
Hd Grey Post Bands
Very Dk Mild Slate cuts like Coal
Depth 482′ 3¼″

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

No 51

WARATAH C.C.

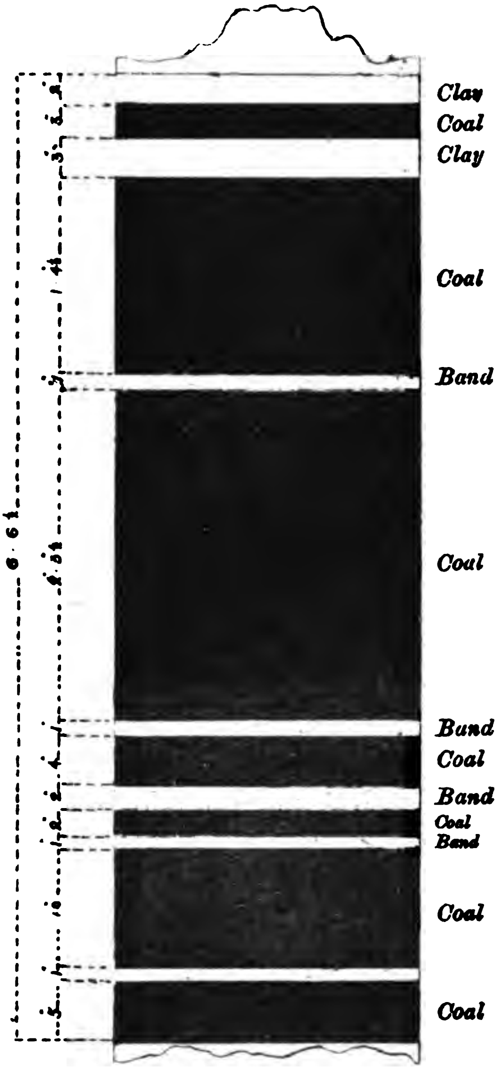
Section of No. 2 Seam in No. 2, Charles' Pit, on north side of shaft.



Nº 52

WARATAH C.C.

Section of No. 2 Seam in No. 2, Charles' Pit, on west side of Shaft.



(82 128-79)

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE.
SYDNEY, NEW SOUTH WALES.

Nº 53

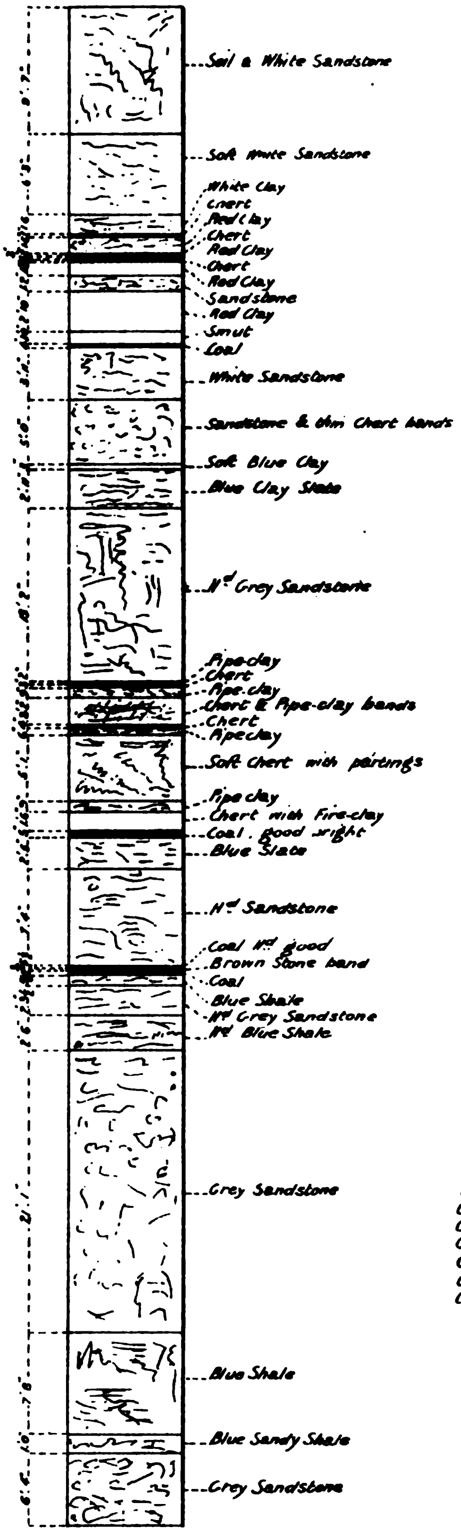
Section of Garrett's Nº 1 Borehole — Teralba

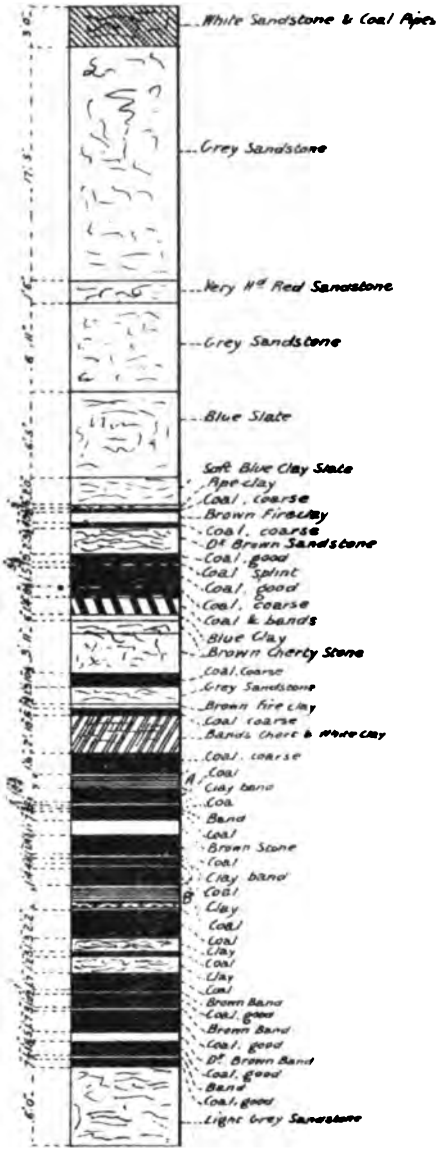
SCALE

FEET 10 5 0 10 20 30 FEET

Total depth of Bore 198'. 2⅞"

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE.
SYDNEY, NEW SOUTH WALES.





Reference at A	
Clayband	3½
Coal Hd Splint	1
Clay band	1½
Coal (good)	4½
Clayband	1
Coal Hd Splint	1

Reference at B	
Clayband	1½
Coal	2¼
Clay	3
Stoneband	¼
Clay	1
Stoneband	¼
Clay	½
Coal	4½
Coal, Hd Stony	2½
Clay	1½
Coal, Hd Stony	1½
Clay	1½
Coal	3
Clay	4

NT H. G.

par, Mica,
de, and
rl.

and the rest goin
that then lived
y, in the aurifer
up to 8 ounces),
of this gigantic
cing or drift gro
y; 2 feet reddish
th vertical stalact
and gravel—th
s of quartz and
is very micaceous
sed by veins (stri
c granite—pegm
ns of crystals of
ance Gully, whe
gold is fine, scal
icate that the vein

Date Due

3 2044 102 944 295